LITHOGRAPHIC ABSTRACTS 1955

Monthly Lithographic Abstracts

September, 1954 through July, 1955

LITHOGRAPHIC TECHNICAL FOUNDATION, Inc.

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Lithographic Abstracts are published monthly in the trade press. Because of the exigencies of magazine publication, a complete set of abstracts cannot be had from one source. For this reason, and for the convenience of the lithographic industry, annual publication commenced with the 1947 issue. The months *September,* 1954 through *July,* 1955 are included in this issue.

These abstracts of important current articles, patents, and books are compiled as a service of the Lithographic Technical Foundation, Inc. They represent statements made by the authors and do not express the opinions of the abstractors or of the LTF.

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PHOTOGRAPHIC EQUIPMENT AND METHODS

THE TESTING OF PHOTOGRAPHIC LENSES AT THE NATIONAL BUREAU OF STANDARDS. Francis E. Washer. *Photographic Engineering* 5, No. 1, 1954, pages 37-53 (17 pages). A summary of the methods employed at the National Bureau of Standards for the evaluation of photographic lens performance is given. This includes a brief description of equipment such as the precision lens testing camera and the camera calibrator, developed for the determination of equivalent focal length, distortion, and resolving power. The methods used in determining the resolving power of photographic lenses are discussed. These include the original high contrast transparency, the charts issued as part of Circular C428, the variable contrast chart and the charts recently issued which form part of Circular 533. The subject of high and low contrast charts is considered briefly. Objective methods of evaluating lens performance such as microdensitometric analysis of negatives and electronic scanning procedures are discussed.

HIGH-BRIGHTNESS XENON COMPACT ARC LAMP. W. T. Anderson, Jr. *Journal of the Society of Motion Picture* and *Television Engineers* 63, No. 3, September, 1954, pages 96-97 (2 pages). Xenon compact arc lamps have been developed which have high brightnesses, spectral-energy distributions in the visible spectrum resembling closely that of sunlight, and color temperatures of 5200 to 6000 K. A 1000-w lamp for a-c operation is described and its characteristics enumerated. When these lamps are operated on suitable a-c electrical circuits, they may be used very satisfactorily in portable equipment for projection of 16mm. film by Cinema-Scope and 3-D optical systems.

A METHOD FOR DETERMINING AREAS OF EQUIDENSITY IN PHOTOGRAPHS. H. B. Archer and W. L. Rhodes. *Photographic Science and Technique* Series II, 1, No. 4, November, 1954, pages 121-126 (6 pages). A preliminary experiment was conducted to determine the percentage area devoted to the different densities in a photograph. Twelve photographs were investigated in this manner. Density separations were made of each photograph and the integral area of each separation was measured electronically. Graphs are presented showing the consistency of density distribution among the photographs with similar subject material, and the average density distribution of all the photographs. The application of this information to the design of a tone-reproduction test object is discussed.

TONE AND COLOR CONTROL IN REPRODUCTION PROCESSES .W L. Rhodes. *TAGA Proceedings,* Sixth Annual Meeting, 1954, pages 48-64 (17 pages). A theoretical system is discussed for accomplishing: 1. Reproducibility or control, i.e., reduction of variability and accurate prediction of tone values. 2. Modification, i.e., willful introduction of variation to compsensate for poor copy such as dark, contrasty, flat, or light originals. Current methods for accomplishing reproducibility and control are reviewed with emphasis given to estimation of tone values on halftones and plates, and prediction of final tone value. Methods for improving reproducibility are discussed. Instruments and techniques for improving reproducibility at Rochester Institute of Technology are reviewed. Illustrations are presented along with discussion of RIT's experience with the automatic separation printer, the Ink Distribution Meter, and statistical quality control. An example of a tone control experiment is given, and samples of the result are shown. Appli-

cation of control techniques to a system of three-color reproduction is discussed, and illustrations of control charts are presented. Copies of the TAGA Proceedings may be obtained from the Secretary-Treasurer, George Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Mass. for five dollars.

MEASUREMENT OF DOT AREA AND SHARPNESS. D. J. Howe and J. A. C. Yule. *TAGA Proceedings*, Sixth Annual Technical Meeting, 1954, pages 111-121 (11 pages). A measurement of percent dot area of a halftone negative is important in the study of tone reproduction in the printing process. Previous methods have been laborious or inaccurate. The measured area of a dot depends upon what part of the dot is selected as the dot boundary. When a printing plate is made from a halftone negative, the dot boundary is a fixed density such that all parts of the dot above this density do not print and all parts of the dot below this density do print. This density is equal to that of the first step of the Sensitivity Guide which prints on the press sheet. An instrument has been constructed which scans many dots and measures the average percent dot area at a given density. Measurement of dot area at several densities may be used as an indication of dot sharpness. The area of a dot examined visually may be different from its printing density. A boundary definition corresponding to the visual boundary of a dot may be established and "visual dot" area measured directly. TAGA Proceedings may be purchased for five dollars from the Secretary, Geo. Hammer, Forbes Litho Mfg., P.O. Box 513, Boston, Mass.

*METHOD OF PREPARING A PHOTOGRAPHIC THREE-DIMENSIONAL GRAIN SCREEN AND PRODUCING A PHOTOGRAPHIC DRY PLATE HAVING A LATENT THREE-DIMENSIONAL SCREEN PATTERN ON IT. *U.S. Patent 2,643,188*. H. E. Meyer. *Monthly Abstract Bulletin* 40, No. 5, May, 1954, page 211. A method of preparing a photographic halftone screen is described, in which a photosensitive plate is inserted in a chamber in which opaque dust particles have been agitated. The plate, with some of the dust particles settled on it, is removed from the chamber, exposed, and reinserted in the chamber for a second coating of dust. It is then re-exposed, after which all the dust is removed, and the plate is processed to form a halftone screen.

*METHOD OF ELECTROSTATIC ELECTROPHOTOGRAPHY. *U. S. Patent 2,693,416*. L. B. Butterfield. *Official Gazette* 688, No. 1, November 2, 1954, page 161. 1. A method of electrostatic electrophotographic reproduction of images which comprises electrostatically charging the outer surface of a sheet of insulating material while its under surface is in contact with a photoconductive layer, producing an electrostatic image on said outer surface of said sheet by exposure to a light image, applying electrostatically attractable powder to the charged outer surface of said sheet, removing said sheet from said photoconductive layer, and then permanently affixing the powder to said sheet of insulating material.

"ELECTROFAX" DIRECT ELECTROPHOTOGRAPHIC PRINTING ON PAPER. C. J. Young and H. G. Greig. *RCA Review* 15, No. 4, December, 1954, pages 469-484 (16 pages). A direct-printing electrophotographic paper having sensitivity to light sufficient for projection printing and enlargement is described. This paper has a white, photosensitive coating made from relatively low-cost, commercially available materials. Its spectral response in the near ultravio-

let can be extended into the visible range by sensitization with organic dyes. Curves showing the electrical and spectral characteristics of the paper are included with a brief description of how these measurements were made. The procedure for making electrophotographic prints is given. Several methods for developing the electrostatic image are mentioned with emphasis on the one which presently shows the most promise in mechanized printing.

* PRESSURE PRESCREENED GRAPHIC ARTS FILM. *U.S. Patent 2,701,199.* R. E. Damschroder and R. E. Stauffer. *Official Gazette* 691, No. 1, February 1, 1955, page 122. 1. The method of prescreening a photosensitive sheet having a flat silver halide emulsion layer on a flat support, which comprises desensitizing a halftone pattern in the flat emulsion layer by pressing against it in the presence of water a hard surface with a halftone pattern of raised dots with a pressure between that obtained with line contact on the layer from 10 pounds pressure on a small printing roller six inches wide and four inches in diameter and ten times this much pressure.

FLUORESCENT PHOTOGRAPHIC PAPER. *American Newspaper Publishers Association Research Bulletin* 101, March 9, 1955, page 11. Ansco-Kemart fluorescent paper is described. It is claimed to provide prints more suited to photoengraving than ordinary paper. The paper has a plastic base with a fluorescent coating, over which is laid a silver emulsion and a protective gelatin coating. Dimensional stability is claimed. For halftone photography a normal halftone exposure is given, followed by a one-minute exposure, using ultraviolet light, to pick up fluorescence in the copy.

GETTING THE MOST FROM YOUR FLASH LAMP. R. L. Yinger. *National Lithographer* 62, No. 4, April, 1955, pages 42-45 (4 pages). Too often the flash lamp on the process camera is not given enough thought by the designer and the photographer. Uneven tints or halftone negatives with fall-off of shadow dots in certain areas may be attributed to a flash lamp which may be poorly designed, in poor condition, or improperly positioned. The lamp should have uniform illumination over its entire face. It should be close to the lens and the face of the lamp should be parallel with the face of the lens. The center of the lamp and lens should coincide.

* PHOTOGRAPHIC PROCESSES USING PRESCREENED MATERIAL. *U. S. Patent 2,708,626.* J. A. C. Yule and R.E. Maurer (to Eastman Kodak). *Official Gazette* 694, No. 3, May 17, 1955, page 383. 1. The method of reproducing line work with a Clayden prescreened photographic sheet with dot corners Clayden desensitized and areas adjacent to the dot centers with substantially no desensitization, which comprises exposing the the sheet uniformly to a high intensity short duration exposure of substantially the same order of duration and intensity as that used in prescreening the film whereby said adjacent areas are Clayden desensitized and the desensitization of said corners is reduced to provide substantially the same sensitivity in said areas and said corners, then exposing the sheet to said line work and developing the sheet.

* PRODUCTION OF PHOTOGRAPHIC PRINTS ON ANODIZED ALUMINUM. D. R. Dhingra, M. G. Gupta and M. C. Bhattacharya. *J. and Proc. Institution of Chemists (India)* 23, Parts III and IV, September-December, 1951, pages 177-189; *Monthly Abstract Bulletin* 41, No. 2, February, 1955, page 80. Aluminum sheets of

high purity were anodized and then coated with silver halide-gelatin emulsion. Prints made on these had good speed and contrast. Details of the anodizing procedure and the steps of making, coating, and processing emulsions are given. Journal and Proceedings of the Institution of Chemists (India) is published by the Secretary, Chemical Department, Medical College, Calcutta, India.

* PHOTOGRAPHIC REPRODUCTION ON ALUMINUM BY THE FOTOANODIZADO AND RICOLOR PROCESSES. J. M. Alemeda. *Electroplating and Metal Finishing* 5, September, 1952, pages 286-288; *Monthly Abstract Bulletin* 41, No. 2, February, 1955, page 80. Two processes of photographic reproduction on aluminum, Fotoanodizado and Ricolor, were developed in the laboratories of Marconi Espanola Sociedad Anonima, in Madrid, Spain, and have been in use since 1949. The former is limited in its color range to blue on aluminum, but some color variation is possible in the latter, through the use of dyes. In the Fotoanodizado Process, aluminum is anodized in the usual sulfuric acid bath and then allowed to dry slowly at room temperature. In a darkroom, the surface coating is sensitized by immersion in ferric ammonium citrate and potassium ferricyanide. When the surface is partially dried, it is buffed with toweling to remove a superficial layer. This is necessary to obtain good contrast. Exposure is 3 to 10 minutes to sunlight or arc light. The blue image is both developed and fixed in dilute nitric acid. The color may be modified either by heating, by chemicals, or by treatment with various dyes. Two reproductions made by the Fotoanodizado Process on duralumin sheet, one consisting of microfilmed pages of a magazine and the other a photograph of an apparatus, are included. Electroplating and Metal Finishing is published at 83/85 Udney Park Road, Teddington, Middlesex, England.

PROCESSING

* PHOTOGRAPHIC SCREENS. *U. S. Patent 2,668,762.* Leon Rubinstein. *Chemical Abstracts* 48, No. 10, May 25, 1954, Column 5702-3. A process is described for producing screens useful in photographic applications by attacking the antihalation layer of an emulsion-less film base with acidic solutions of I. Thus, a typical oxidizing solution consisted of concentrated I 1, decolorized I (N.F. VI) (A) 3, formalin 1, HCl 1 dram, NaCl 2, and distilled H_2O 16 oz. Solution A was prepared by the addition of 50 grams of I and 400 cc. EtOH to 25 grams of KI in 400 cc. H_2O. When the I dissolved, there was added 100 cc. of 37% NH_4OH, and the mixture was allowed to stand until colorless. The volume was brought to 1000 cc. with additional EtOH. When a photographic film with an antihalation backing was stripped of its emulsion and treated with the oxidizing solution, a screen-like corrugation was produced having a fine mosaic crystal structure. The screen proved useful (1) as a background for the retouching of separation negatives, (2) for changing the texture of other screens when placed in conjunction with them, (3) as a photographic diffuser, and (4) for sundry other photographic uses.

* STRIPPING A MULTILAYER COLOR FILM. *U.S. Patent 2,670,312.* John G. Capstaff. *Chemical Abstracts* 48, No. 15, August 10, 1954, Column 8688. A multilayer color film of base support, red-sensitive emulsion layer, water-permeable interlayer, green-sensitive emulsion layer (I), water-permeable interlayer, yellow filter layer, blue-sensitive layer (II) uppermost, is separated at II and I, respectively, in 2 separate steps by the use of a transfer film and stripping apparatus. Thus, the multilayer film is preconditioned, soaked in H_2O for a predetermined time, brought into pressure contact with the unsensitized

transfer film and, while still submerged, the film is separated at II. The process is repeated to separate the film at I.

A NEW METHOD OF REVERSAL PROCESSING. Kodak, Ltd. *Process Engravers Monthly* 61, No. 721, January, 1954, pages 10 and 13 (2 pages). In the past, reversal processing of line and halftone images has not been widely practised because of the unsuitable characteristics of the materials available. In giving sufficient exposure to reach the base of a material through a comparatively thick-coated emulsion, fine detail was often lost. "Kodalith" materials, with their thin emulsion coating and physical hardness, are well suited to reversal processing. They reverse very easily and by using them with the etch bleach method a relief image is obtained; the gelatine surrounding the metallic silver (resulting from the first exposure and development) is dissolved away. Thus, transparent areas on the final negative or positive consist of the clearbase itself. Maximum brilliance is secured and (unlike other reversal methods) there is no danger that residual gelatine will cause staining.

*TRANSFER PROCESS WITH DEVELOPMENT BY HEAT. *German Patent 895,101.* E. Weyde. *Photographic Abstracts* 34, Part 2, 1954, page 72. The negative layer contains light-sensitive silver halides, one of the usual developing agents, e.g. metol and a compound which on heating liberates water or an alkaline material, e.g. urea. The image receiving layer contains a product which forms a visible reaction product with the developing agent when it is evaporated by the heat of, for instance, a ferrotype press, in the unexposed areas of the negative. A starch coating may be applied to prevent sticking together of the two sheets. Suitable positive layers contain a copper salt, methylphenylpyrazolone or sodium o-nitrosobenzoate in gelatin or polyvinyl alcohol. A photoprint of German Patents may be obtained from the U. S. Patent Office, Washington 25, D. C.

*PHOTOMECHANICAL PROCESSES. *U.S. Patent 2,704,252.* D. C. Gresham. *Official Gazette* 692, No. 3, March 15, 1955, page 365. 1. A method of producing screen positives directly from originals by a reversal technique, which method comprises exposing a photographic element having an emulsion of high contrast behind a halftone screen to light from an original subject, developing the screen latent image obtained with an aromatic primary amino developing agent in the presence of a color coupler which combines with the oxidation products of such developer to produce a dye image, thereby producing a negative screen image made up of areas of developed silver with a dye image in situ therewith, said development being such as to produce a dye image with a gamma value of at least approximately 2.5, bleaching the said silver image, exposing the unexposed areas of the said photographic element to light incident on the same side thereof as the original exposure, the said light of a color to which the photographic emulsion is sensitive and being of such intensity that the light is substantially completely absorbed by the said dye image at its maximum density, redeveloping the said photographic element to a gamma of at least approximately 4.0 in a developer which will not redevelop any re-halogenized silver negative image which may be present, fixing the photographic element to remove the silver halide remaining below the negative image which has been optically screened from the second exposure and to remove any silver halide remaining below the positive image and any re-halogenized silver of the negative image, and then removing the negative dye image.

THE NEWER DEVELOPING AGENTS. T. T. Hill. *Photographic Engineering* 5, No. 4, 1954, pages 239-242 (4 pages). The discussion covers some of the general results from a preliminary study of some of the newer photographic developing agents which have been recently proposed for black and white processing. Three of these newer developing agents are Phenidone*, Triamol (Triaminophenol trihydrochloride) and Tetra Q (8 Hydroxy 1,2,3,4-tetrahydroquinoline). The discussion covers their general characteristics, the comparative results obtained, and a comparison with standard, older developing agents. (*Registered trademark of Ilford, Ltd.)

* PHOTOSENSITIVE RESIN. *U. S. Patent 2,673,151.* Gerhart. *Photographic Engineering* 5, No. 4, 1954, page 282. It has been discovered that copolymerizable mixtures of (a) polyesters of alpha-beta ethylenic, alpha-beta dicarboxylic acids and (b) ethylenically unsaturated compounds copolymerizable therewith can, by addition of certain sulfur compounds be readily sensitized to the action of light, in such manner as to permit the use of the materials for photographic reproduction. Exposure is prolonged under the action of the light at least until partial polymerization, e.g., a gel stage is reached. Images are produced usually in low relief upon the body of resin. There are no separate layers or media. The resin assumes a hardened thermoset state in which it is highly durable and insoluble and thus imparts great permanence to the reproduction.

PARTIAL REVERSAL LINE. Wynn Bullock. *Photographic Journal* 95A, April, 1955, pages 67-69 (3 pages). Partial reversal of continuous-tone or line images to provide line outline effects is described. Object is illuminated to appear as silhouette against even background. During development of a film a fogging exposure is given. Background and object densities become equal but outline is produced. Width of the line is related to sharpness of focussing. (See U.S. Patent 2,438,494, British Patent 669,633).

PHOTOLITHO NOTES. J. S. Mertle. *National Lithographer* 62, No. 4, April, 1955, pages 48-49 (2 pages). The DuPont Company has patented an anti-bronzing compound which will keep the silver image on a paper print from changing color or becoming lower in density when ferrotyped. Silver can be reclaimed from the exhausted hypo solution, but unless large amounts of hypo are processed, it is not worthwhile. A formula for a film cement patented by Eastman Kodak is given. A colored lacquer, which can be stripped, is described. It can be sprayed on windows to reduce the color temperature of the sunlight so that it approaches that of artificial light. The author suggests that it be used in the windows of the platemaking room to reduce the possibility of fogging the plates. A method of reproducing colored maps without a camera is described. Using special films contact positives and separation negatives can be made. This is based on the theory of solarization and the Herschel effect. The range of acidity of printing paper is discussed.

BLOCKING OUT REVERSES. M. J. Monse. *National Lithographer* 62, No. 5, May, 1955, pages 38-39 (2 pages). The use of "spread positives" or negatives to block out backgrounds on two-color lettering jobs is described. One method of making a spread positive is to place a few sheets of clear acetate between the negative, emulsion side up, and the unexposed film, emulsion side up. Another method is to rotate the light source over the sandwich. A third method is to rotate the sandwich in a printing frame with the light at an

angle to the sandwich. Different type faces can be created by manipulation of these techniques.

HALFTONE PHOTOGRAPHY

THE CONCEPT OF THE CHARACTERISTIC CURVE. W. L. Rhodes. *Modern Lithography* 22, No. 8, August, 1954, pages 48-50, 56-57 (5 pages). Use of a densitometer is advocated for measurement of tone values in original, halftone negatives, and press sheet. From these data characteristic curves are constructed which show the relationship between halftone and print, and from which the original-versus-halftone relationships can be determined. This information can be used to set specifications for halftones, and the densitometer can be used to check halftones for conformity to specifications. The use of these techniques tends not only to improve average quality, but also to increase efficiency of plant operation.

* PHOTOGRAPHIC LIGHT SENSITIVE MATERIAL FOR MAKING HALFTONES. *U.S. Patent 2,691,586.* J. A. C. Yule and R. E. Maurer. *Official Gazette* 687, No. 2, October 12, 1954, page 393. 1. A photographic material comprising a support and a uniformly thick photosensitive silver halide emulsion layer on the support with a halftone pattern of undulating sensitivity uniformly distributed throughout the layer with the areas of lower sensitivity Clayden desensitized.

* PRESCREENED POSTERIZING PHOTOGRAPHIC FILM. *U.S. Patent 2,691,585.* J. A. C. Yule and R. E. Maurer. *Official Gazette* 687, No. 2, October 12, 1954, page 393. 1. A photographic material for posterizing comprising a support and a uniformly thick photosensitive silver halide emulsion layer on the support with Clayden desensitization distributed throughout the layer in a uniform posterizing halftone pattern with at least three and not more than eight levels of different substantially uniform sensitivities, varying in any one level less than one third the difference between the sensitivities of successive levels.

* PRESCREENED PHOTOGRAPHIC FILM EMPLOYING ALBERT REVERSAL. *U.S. Patent 2,691,583.* R. E. Maurer. *Official Gazette* 687, No. 2, October 12, 1954, page 392. 1. A photographic halftone material comprising a flat support and a uniformly thick photosensitive silver halide emulsion layer on the support with a halftone pattern of Albert reversal dot areas the halftone pattern being a uniformly distributed undulating one with a sensitivity at the maximum reversed points which are called the corners of the dot areas, equal to less than one-fifth the sensitivity at the centers of the dots, produced by a process which includes exposure of the layer through a halftone screen between threshhold Albert and optimum Albert exposure for all points of the dot pattern and immersing the exposed layer in a bleach bath which is non-solvent for silver halide.

* INCREASING CONTRAST OF HALFTONE REPRODUCTIONS. *U. S. PATENT 2,691,* 580. D. J. Howe. *Official Gazette* 687, No. 2, October 12, 1954, pages 391-392. 1. The method of making a halftone record on a Clayden desensitizable silver halide photosensitive sheet material which comprises placing a halftone screen in front of the material, exposing the material through the screen twice, first to a uniform high intensity short duration exposure to Clayden desensitize the areas behind the transparent parts of the screen and second to a continuous tone image of lower intensity and for longer duration and then developing the material.

* PLATES FOR HALFTONE PROCESSES. *British Patent 699,340.* R. M. Evans, R. E. Stauffer and H. C. Yutzy. *Photographic Abstracts* 34, Part 3, 1954, page 173. A lithographic silver halide emulsion is sensitized using an intaglio roller containing green or red sensitizing dye in the cavities. The emulsion may be stored after drying and used to prepare halftone plates without the use of a screen, the plates being printed through a green or red filter.

NEW METHOD FOR HALFTONES. *Modern Lithography* 23, No. 5, May, 1955, page 86C. A news item from Eastman Kodak reports that a halftone tint can be used with a continuous-tone negative to make halftone film positives or printing plates. The continuous-tone negatives is placed emulsion down on the sensitive surface. The halftone tint is then placed over the negative. Depending on the contrast desired, the tint can be placed emulsion down or up. The contrast of the final print will depend on the screen ruling, percent tint and spacing between tint and the negative.

COLOR—SEPARATION AND CORRECTION

SUBTRACTIVE COLOR PHOTOGRAPHY: THE ROLE OF MASKS. W. T. Hanson, Jr. and W. L. Brewer. *Journal of the Optical Society of America* 44, No. 2, February, 1954, pages 129-134 (6 pages). Color photographic masks can be applied in such a manner as to minimize color-reproduction errors in a photographic process, regardless of the source of these errors. Overlapping absorptions of the dyes probably cause the most serious errors and therefore receive the most attention. It is shown, however, that the lack of negative portions in the required sensitivity distributions contributes appreciably to the reproduction errors and can, at least partially, be corrected for by masking. One set of masking equations is derived which is designed to correct only for the overlapping absorptions of the dyes. A second set is derived which is designed to correct only for the lack of negative portions in the sensitivity distributions. It is shown that the set of equations obtained by combining these two sets of equations is essentially the same as that derived directly to correct for these two sources of reproduction errors considered simultaneously.

* OPTO-ELECTRIC COLOR CORRECTION APPARTUS. *U.S. Patent 2,691,917.* Paul N. Curry. *Official Gazette* 687, No. 3, October 19, 1954, page 538. 1. In an electrical optical system for reproducing a color photograph, the combination: means producing a pilot beam of poly-chromatic light, the intensity of said beam being nonconstant with its intensity peaks occurring at a pre-determined frequency; means providing a beam of monochromatic light of constant intensity constituting an exposing beam; an optical system gathering said beams into a single beam and directing same onto a single elemental area of a transparency and means causing said single beam to scan a plurality of elemental areas of said transparency; a light sensitive electric device; means holding light sensitive material; means directing a portion of the light passing through said transparency onto said light sensitive electric device and directing another portion of said light onto light sensitive material; a frequency responsive filter circuit operatively associated with said light sensitive electric device and adapted to transmit only output impulses therefrom of said frequency; a light valve in the path of said monochromatic beam and means including controllable and selectable means comprising a modulating section connecting the output of said filter circuit to said light valve.

REPRODUCTION FROM 35 mm. *Kodak Bulletin for the Graphic Arts* 2, 1954, pages 6-7 (2 pages). 35mm transparencies are subjected to color separation by the Time-Scanner and a number can be placed on the machine at the same time, provided the total area does not exceed 8 x 10". Separations are made on Kodak Panatomic X Film at a scanning frequency of 1000 lines per inch. Continuous-tone positives are made from these negatives using Eastman 33 plates, from which final halftone negatives for photoengraving are made. No masking is necessary on the original color transparencies.

A COLOR CORRECTION PROCESS. Philip E. Tobias. *TAGA Proceedings,* Sixth Annual Meeting, 1954, pages 85-90 (6 pages). A method of color correction has been developed based upon the observation that any color within the gamut of the four-color process printing inks can be reproduced by pairs of the chromatic inks plus black. The chromaticity coordinates of a color will vary with the two chromatic ink mixtures, whereas the luminance is affected by the amount of black used. A device is developed in which the empirical relationship existing between the chromaticity of a given copy and the amounts of each of the chromatic inks required for match is readily employed. The luminance of the copy is then matched by addition of black. Inherently, this process has the advantage of basic simplicity, allowing empirical compromises or corrections for distortion. Copies of the TAGA Proceedings may be obtained from the Secretary-Treasurer, George Hammer, Forbes Lithograph Mfg. Co., P. O. Box 513, Boston, Mass., for five dollars.

PHOTOGRAPHIC AND PHOTOMECHANICAL ASPECTS OF ELECTRONIC COLOR CORRECTION. J. S. Rydz and V. L. Marquart. *TAGA Proceedings,* Sixth Annual Technical Meeting, 1954, pages 139-150 (12 pages). A review of the RCA Electronic Color Correction process is presented with emphasis on its photographic and photomechanical aspects. In order that full advantage of the method may be realized, photographic separations must meet certain specifications, and the corrected recordings must be processed by a procedure standardized by the user. Photographic separation requirements are discussed and data illustrating the techniques used to obtain the separations are presented. Flexibility in processing electronically scanned plates is obtained through the introduction of an experimentally derived tone compensating curve in the recording of the output information. Thus an overall linear tone reproduction will result if the scanned recordings are processed by the procedure used in deriving the distortion curve. Data illustrating this procedure will be presented. The Proceedings may be obtained for five dollars each from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Massachusetts.

HIGHLIGHT MASKING. F. C. Kahoun. *National Lithographer* 61, No. 11, November, 1954, pages 40-41. The need for highlight masking in color separation work is discussed. The use of high contrast film with DK-60a developer is recommended. However, the masks should not be made too heavy. A density of 0.3 is suggested as being the most suitable.

A NEW COLOR SCANNER. Frank Preucil. *National Lithographer* 61, No. 9, September, 1954, pages 30-31 (2 pages); *Graphic Arts Monthly* 26, No. 9, September, 1954, pages 74, 76, 78, 80, 122 and 124 (6 pages). The author describes the Acme Color Separator which produces corrected *posi-*

tives direct from positive color transparencies. The apparatus is manufactured by Acme Teletronix (Cleveland, Ohio), a subsidiary of Scripps Howard. Color transparencies up to 8" x 10" are wrapped round cyclinder and 4 color corrected images are exposed with only one scanning. 250 lines per inch are scanned at rate of 4 minutes per inch or about ½ hour for 8" x 10". Either 250 or 500 lines per inch are possible and the scanner is not limited to same size production.

* COLOR CORRECTING IN PHOTOMECHANICAL PROCESSES. *U. S. Patent 2,692,825.* F. A. Sportelli. *Official Gazette* 687, No. 4, October 26, 1954, pages 853-854. A set of positive transparencies for use in photomechanical preparation of printing surfaces comprising a pair of registering color separation positives for each of a plurality of colors to be reproduced, each pair of positives comprising a normal positive and a relatively thin and flat compensating positive, the color compensating positive having areas blocked out which correspond to areas of the normal positive in which the density correctly represents the color to be reproduced.

COLOR FOR SHORT RUNS. A PRACTICAL APPROACH. R. D. Schulz. *National Lithographer* 61, No. 11, November, 1954, pages 28-29 (2 pages). Color reproduction from 35-mm. Kodachrome transparencies, using a single mask, three special inks, and gray contact screens, is described. The method is also suited to the reproduction of larger color transparencies by a contact technique. Register throughout is obtained by using the transparency support, Kodak Pan Masking Film, and Kodalith Pan Film which is used for the halftone color separation negatives. The plate, if for a small Multilith or Davidson press, may also be prepunched to provide accuracy in register during platemaking and press operation. Presensitized plates are used.

* PROCESS FOR THE PRODUCTION OF COLORED MASKS IN PHOTOGRAPHIC COLOR MATERIAL. H. Berger and E. Weyde, *U.S. Patent 2,694,008. Official Gazette* 688, No. 2, November 9, 1954, page 361. 1. A light sensitive material for producing masked color photographic images which comprises (a) at least one light sensitive silver halide emulsion layer containing a color coupler which couples with the oxidation product of a primary aromatic amino developing agent upon photographic development to give a colored image and (b) a masking layer containing a spontaneously developable silver salt emulsion which is developable in a special photographic developing solution without exposure to actinic light and from about 1% to about 10% of the whole mixture of a light sensitive silver salt emulsion which is developable in said special developing solution only after exposure to actinic light, said spontaneously developable silver salt emulsion being of such lower light sensitivity than said light sensitive silver salt emulsion that upon exposure to the object to be reproduced only said light sensitive silver salt is affected, said special developer being a solution of a primary aromatic amino developing agent containing a solvent agent for said spontaneously developable silver salt and containing salts having the same anions as those of said light sensitive silver salt at most in such a quantity that the reduction of said spontaneously developable silver salt emulsion is not prevented, said masking layer containing furthermore a color coupler as defined above and reduction nuclei said reduction nuclei being capable of catalysing the reduction of a silver salt emulsion to silver by a photographic developing solution without exposing said emul-

sions containing said reduction nuclei to actinic light.

FOR COLOR SEPARATIONS: COLORED FLUORESCENTS. F. C. Kahoun. *National Lithographer* 62, No. 2, February, 1955, pages 30-32 (3 pages). The advantages and disadvantages of colored fluorescent lights for camera work are discussed. Advantages are: cleanliness and economy of light source, absence of filters from lens, copy can be observed under colored light, and lighting is even. Oil paintings can be photographed without the effects of excessive surface highlights. Disadvantages are: fluorescent lamps are not sufficiently strong for line and halftone work, the large filters attract dust and may be damaged, and separations should be shot in a darkened room.

3-COLOR OFFSET. *Modern Lithography* 23, No. 1, January, 1955, page 38. The Eastman Kodak 3-Color System of lithographic reproduction is described. This system is intended for short-run work where plate preparation costs are a big factor. Color separations are made through a set of angled Kodak Grey Contact Screens and no handwork is performed. Special 3-color inks are used and pin registration throughout.

* PHOTOMECHANICAL CORRECTION OF PHOTOGRAPHIC IMAGES. *U.S. Patent 2, 701,196.* R. M. P. Conrad. *Official Gazette* 691, No. 1, February 1, 1955, page 121. 1. A method of producing a corrected photographic record from a photographic transparency, including the steps of disposing the transparency in a first plane, projecting into a part of a second plane, with the aid of a lens, a focused image of at least a portion of the transparency, disposing a photosensitive surface in a position spaced from the transparency on the side of the transparency remote from the second plane, illuminating the said part of the second plane to expose the said photosentitive surface to light projected therefrom through the lens and transparency, processing the photosensitive surface to produce a correcting mask, placing the mask in the aforesaid position, disposing a photosensitive recording surface in the said part of the second plane, directing light through the mask and the transparency, in the order stated, to project onto said recording surface with the aid of said lens, a focused image of the transparency illuminated through said mask, and exposing said recording surface to the so illuminated image.

* PHOTOGRAPHIC COLOR CORRECTION. *U.S. Patent 2,704,711.* W. T. Hanson, Jr. *Official Gazette* 692, No. 4, March 22, 1955, page 491. 1. An integrally masked color-forming photographic emulsion layer, comprising a silver halide emulsion sensitive to the blue region of the visible spectrum, containing a dispersion of a color coupler capable of forming upon color development with a primary aromatic amino developing agent a yellow dye image which absorbs a major proportion of blue light and a minor proportion of green light, and individual packets of the ammonium salt of styrene-maleamic acid resin containing colloidal silver and a color coupler capable of forming upon coupling with the developer oxidation product of said primary aromatic amino developing agent a magenta dye absorbing said green light but absorbing no substantial amount of said blue light.

THE NEW R. C. A. COLOR SCANNER. Fred Lewis. *Share Your Knowledge Review* 36, No. 6, March, 1955, pages 20-24 (5 pages). The early machines mechanically scanned the copy. This required big and complex equipment. The RCA unit uses an electronic scanning system, and an electro-

nic computer to correct for deficiencies in the printing process. The RCA unit does color and tone correction only. The three continuous-tone separations are scanned by the machine and a corrected negative or positive is produced. In addition a black plate is made. The unit corrects for errors in the camera process, deficiencies of the inks and paper and for losses and errors in the final processing steps.

* NEW CHROMART TRICOLOR SEPARTION NEGATIVE MATERIAL AND PROCESS. Hans v. Fraunhofer. *Brit. Kinemat.* 26, 1954, pages 79-80; *Chemical Abstracts* 49, No. 3, February 10, 1955, page 1455. The Chromart-Tricolor separation negative material and process is based on the principle of Ag solvent transfer, and uses only Ag instead of dye images. The following layers are coated in order on safety base to form the light-sensitive material: anti-halo layer, red-sensitive emulsion layer, plain gelatin insulating layer, green-sensitive emulsion layer, yellow dye filter layer, and blue-sensitive emulsion layer. Development and fixing are carried out as though the film were a normal black-and-white negative. The Ag image of the top layer then is bleached to prepare it for transfer to a new support. The transfer material consists of a base coated with a gelatin layer containing a metal sulfide. This layer is soaked in a solution containing a Ag halide solvent which, when the layer is brought in contact with the bleached film, causes transfer of the Ag salt to the transfer layer where a Ag_2S image is formed. The gelatin of the top and filter layers then is removed and the green record image is bleached and transferred to a new support, leaving the red record on the original support. British Kinematographer is published by the British Kinematograph Society, 164 Shaftesbury Avenue, London, W. C. 2, England.

COLOR SEPARATION. Frank Preucil. *Graphic Arts Monthly* 27, No. 5, May, 1955, pages 66, 68, 70 and 73 (4 pages). After a brief history of color separation methods the author explains the subtractive color process. The functions of the three process inks are examined and the reasons for using the various filters for color separation are given.

* BASIS FOR EVALUATING THE PHOTOMECHANICAL COLOR CORRECTOR. Walter Heinrich. *Papier und Druck,* January, 1955, pages 8-10; (in German) abstract from *Deutschen Gesellschaft für Forschung im graphischen Gewerbe,* January, 1955. The use of the photomechanical correction process may occur: after a careful evaluation of masking and color separation methods, after gathering data about the process, by having on hand a color control chart with which the work may be compared by eye and through calculated values following the control chart. The last method gives the safest results. The procedure is distinguished in single and two-stage correctors. Papier und Druck is published by Verlag "Die Wirtschaft," Berlin, East Germany.

PRINCIPLES OF A NEW MASKING SYSTEM. H. P. Paschel. *Gravure* 1, No. 4, April, 1955, pages 40-41 (2 pages). The Agfa Kom-Bi-Film method of color correcting color transparencies is described. Three multilayer films are used. One has a blue-sensitive layer which color develops into a yellow image, and a red-sensitive layer which produces a cyan image. The second film has blue and red sensitive layers which provide the yellow and magenta masking images. The third film is green and red sensitive and develops into magenta and cyan images.

* FUNDAMENTALS OF COLOR REPRODUCTION. R. W. G. Hunt.

Nature 174, July 3, 1954, pages 12-16; *Monthly Absract Bulletin* 41, No. 2, February, 1955, page 120. The introduction of the Young-Helmholtz three-color theory of vision into color photography is described, and the principles of the additive and subtractive methods are explained, an account being given of their application in photography, televisión, and printing. Nature is published by Macmillan & Co. Ltd., St. Martin's Street, London W. C. 2, England.

PHOTOTYPE

PHOTO-TYPESETTING VS. REPRO. PULLS. Fred Worth. *Modern Lithographer and Offset Printer* 50, No. 11, November, 1954, pages 21-22 (2 pages). One of the claims for photographic typesetting is that it gives such sharp results. While this may be true for the best work, unfortunately all work done by this method does not come up to this standard. Some of the books printed by this method are not as good as one might expect. Photographing first class impressions, taken on art paper, will give good results. Too often one finds that lithographers do not know what a good impression is.

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II. Planographic Printing Processes

GENERAL

* METHOD OF PRINTING. *U.S. Patent 2,696,168.* J. P. Costello. *Official Gazette* 689, No. 1, December 7, 1954, page 93. 1. Method of protecting wet ink films on printed surfaces which comprises applying to the surface, over the wet ink, a continuous, thin film of a transparent film-forming coating solution by passing the printed surface, while the ink thereon is still wet, in direct, non-wiping contact with a solid contact surface wet with a thin film of the solution, the solvent constituent of the solution being volatile and the solution being a non-solvent for the wet ink.

"DARK REACTION" IS VILLAIN BEHIND WARM WEATHER PLATE TROUBLES. *Printing Magazine* 78, No. 9, September, 1954, pages 73 and 76 (2 pages); from *LTF Research Progress* No. 31, July, 1954, available from the Lithographic Technical Foundation, 131 East 39th Street, New York 16, for $0.30 to members and $1.00 to non-members. A review of "dark reaction" in bichromated coatings prepared by LTF. The article discusses the causes of dark reaction in surface and deep-etch coating and how to minimize its effects.

SHORT CUTS IN OFFSET PLATEMAKING. *Inland Printer* 134, No. 5, February, 1955, pages 37-40 (4 pages); *Modern Lithography* 23, No. 2, February, 1955, pages 34, 36, 113 and 115 (5 pages); from *LTF Research Progress* No. 33, available for $0.30 to members, $1.00 to non-members from the Lithographic Technical Foundation, 131 East 39th Street, New York 16, N. Y. Reviews steps in platemaking that can be cut to reduce costs and those that can't, and gives instructions for making halftone vignettes.

* DIAZOTYPE PROCESSES AND MATERIALS FOR PRODUCING PHOTOMECHANICAL PRINTING PLATES. *British Patent 706,028.* Kalle and Co. A. G. *Printing Abstracts* 9, No. 5, May, 1954, page 368. A water-insoluble diazo compound which contains several, preferably two, 2-diazonaphthol-(1) or 1-diazonaphthol-(2)

sulphonic acid residues in ester-like combination in the molecule is claimed as the light-sensitive constituent of the coating of a photo-litho plate.

* SENSITIZATION OF COLLOIDS BY AZIDOAROMATIC COMPOUNDS. *French Patent 1,025,736.* B. Ostersetzer, W. Mauss and M. Kuhl. *Le Procédé* 50, Nos. 3-4, March-April, 1954, page 29 (in French); *Printing Abstracts* 9, No. 6, June, 1954, page 446. After exposure to light of sensitive coatings on metal, prepared in accordance with French Patent 886,-716, and removal of the non-insolubilized portions, the plate is subjected to a temperature between 200° and 400° C.; the baked coating is ink-receptive.

* LIGHT SENSITIVE CYLCIC KETONES. *German Patent 901,127.* W. Neugebauer, M. Tomanek and T. Scherer. *Photographic Abstracts* 34, Part 3, 1954, page 171. The use of unsaturated 2-furyl ketones described in German Patent 884,152 which polymerize on exposure to light to form an ink-receptive relief, has been extended to the analogous thiophenyl and pyrryl ketones, e.g., 2-cinnamoylthiophene. German Patents may be obtained as photoprint from the U.S. Patent Office, Washington, D. C.

* COMPOSITION FOR LITHOGRAPHIC PLATE COATING. *U.S. Patent 2,690,395.* V. L. Gregory. *Official Gazette* 686, No. 4, September 28, 1954, pages 880-881. 1. An image forming coating for lithographic plates comprising a colloid selected from the group consisting of albumen, casein, and a soluble gum; a light sensitive material selected from the group consisting of ammonium bichromate, sodium bichromate, and potassium bichromate; and a substance which will form an emulsion in water selected from the group consisting of dried milk, dried whole egg, and natural soybean powder.

ENZYME DESTROYS SUGAR IN ALBUMIN. *Graphic Arts Monthly* 27, No. 2, February, 1955, pages 110 and 146. An enzyme (gluctose) has recently been found which causes the destruction of the sugar in egg whites but will not destroy any of the other components of the albumin. Gluctose is a combination of two enzymes—one breaks down the glucose into H_2O_2 and the other decomposes the H_2O_2 into O_2 and H_2O.

THE EFFECT OF CHROMIC AND CHROMIC-PHOSPHORIC ACID RINSE SOLUTIONS ON THE DURABILITY OF PAINT COATINGS. Jodie Doss. *Organic Finishing* 16, No. 6, June, 1955, pages 7-13 (7 pages). Phosphate coated steel panels were rinsed in various concentrations of chromic acid, chromic-phosphoric and phosphoric acid rinse solutions. The phosphated panels were then separated into three groups and spray painted with three types of paint. The painted panels which were previously phosphated and rinsed in solutions containing 30 oz. CrO_3/100 gal. or 16 oz. CrO_3 plus 16 oz. H_3PO_4/100 gal. exhibited less corrosion after salt spray and fewer paint blisters after water immersion than the panels rinsed in other rinse solutions. The panels rinsed in the solutions at room temperature resisted corrosion and paint blistering just as well as panels rinsed in solutions maintained at 165° F. The panels which were rinsed in the 32 oz. H_3PO_4/100 gal. rinse at room temperature exhibited a considerable amount of corrosion resistance in the water immersion test, but in the salt spray test, the phosphoric acid rinsed panels had the most corrosion products and paint flaking.

SAND BLAST GRAIN VS. STANDARD GRAIN FOR OFFSET PLATES. R. von Gunten. *Fachhefte,* 1, January, 1955, pages 13-15 (3 pages) (in German). Both currently used methods of graining are com-

pared. The grain obtained with sand and graining chemicals in the grainer is used up quickly by the action of high speed and pressure on the rollers; sand blasting with high pressure air and nozzles produces a pointed and deep grain that produces uneven printing.

MATERIALS AND METHODS

* PHOTOGRAPHIC PROCESSES AND PHOTOMECHANICAL PRINTING PLATES. *British Patent 678,599.* Kalle and Company, A. G. *Abridgement of Specifications* XX, 1954, page 308. A layer comprising a water-soluble colloid and an aromatic azido compound on a base as of aluminium, zinc or glass is exposed under a negative, washed with water to remove unexposed parts of the layer, and heated as in an oven to between 200° C. and 400° C. to tan the remaining colloid and convert it to a mechanically resistant and fatty ink receptive form. The colloid may be polyvinyl pyrrolidone, polyvinyl alcohol, polyacrylic acid or its salts, polyacrylic acid amide and its N-substitution products, gum arabic glue, casein, albumin gluten, cellulose ethers, carboxy alkyl cellulose or tragacanth. The azido compound may be sodium 4:4-diazidostilbene-2:2¹-disulphonate, sodium 1: 5-diazido-naphthalene-3:7-disulphonate, or the sodium salts of 4-azidonaphthalene-1:8-dicarboxylic acid, 4:4-diazido-diphenylmethane-3:5-dicarboxylic acid or 4-azidobenzalacetone-2-sulphonic acid. Sensitizing agents such as eosin, or non-sensitizing dyestuffs such as methylene blue which impart visibility to the tanned areas after washing may be added to the coating solutions. Four examples describe coating solutions, coating of plates, exposing and processing to printing plates; and eight further examples describe additional coating solutions only, all of the examples using the materials listed above.

* PHOTO-MECHANICAL PRINTING PLATES. *British Patent 678,321.* Kodak, Ltd. *Abridgement of Specifications* Group XX, 1954, page 301. A lithographic plate in which a cellulose organic ester is surface hydrolysed, sensitized with an oxidant for the surface, and exposed to image-forming light, is treated with an alkaline solution free from oxidizing agents to remove exposed areas of the hydrolysed surface, such areas then being ink-receptive. The method is similar to that of Specification 617,227 except that in the latter an oxidizing alkaline solution is used for removal of the exposed areas. Alkali metal and ammonium bichromates; uranyl salts such as the sulphate, nitrate, acetate or chloride; persulphates, periodates and hypochlorites; and ferric salt oxidants such as the sulphate, nitrate, oxalate, acetate and chloride may be used as sensitizer, and aqueous sodium hydroxide or carbonate, alkali phosphates and bases such as trimethyl benzyl ammonium hydroxide may be used as alkaline solution. The base sheet of cellulose ester may be reinforced by lamination to paper or aluminum foil as described in Specifications 678,323 or may contain an inter-laminar antihalation layer as of Specification 678,322. Four examples detail the process. Specification 548,903 (Group IV), also is referred to.

* PHOTOGRAPHIC ELEMENTS FOR LITHOGRAPHY. *British Patent 678,322.* Kodak, Ltd. *Ibid.*, page 301. A laminated cellulose ester sheet is provided with an anti-halation stratum on one of the outer surfaces. The element may be made by coating a sheet of fully esterified cellulose ester such as the triacetate, acetate propionate or propionate with antihalation material such as the blue-absorbing dye p-nitrobenzene-azo-N-(β-hydroxyl-ether)-o-chloroaniline dissolved in a mixture of β-methoxy ethanol, acetone and methanol, drying; fixing

to a similar, clear cellulose ester sheet with a dope of cellulose triacetate in methylene dichloride, ethylene dichloride and methanol, drying; surface hydrolysing with alcoholic caustic alkali, washing, drying and sensitizing with chromium, iron or uranium salts as described in Specifications 617,227, 678,321 or 678,323. For higher antihalation density both sheets may be dyed before lamination. Lithographic printing plates may be made by exposure under a negative and washing with an alkaline solution or such containing an oxidizing agent, which leaves exposed areas of cellulose ester receptive to greasy printing inks and non-exposed areas of hydrolysed cellulose ester ink-repellant when moistened.

* PHOTO MECHANICAL PRINTING PLATES. *British Patent 678,323.* Kodak, Ltd. *Ibid.*, page 302. Lithographic plates are made by sensitizing a hydrolysed surface of a cellulose organic acid ester sheet with a ferric salt reducible with blue or ultra-violet light but incapable of oxidation of hydrolysed cellulose ester to the alkali removable state, such as ferric ammonium citrate, oxalate or tartrate; exposing to image-forming light to produce a ferrous salt image in the exposed areas, and treating the sheet with an oxidizing solution followed by or including alkali to remove the hydrolysed cellulose ester from the exposed areas. It appears that the ferrous salt has a catalytic effect, permitting such removal. Sensitization of the sheets may be effected in advance of use as distinct from bichromate sensitizations, which deteriorate rapidly. The ester sheet may be reinforced by lamination as to aluminium foil or waterproof paper before or after hydrolysis and may be furnished with an antihalation layer, particularly that described in Specification 678,322. By incorporation of potassium ferricyanide or a water-soluble silver salt into the sensitizer or application of a solution of such immediately after exposure, the exposed image becomes visible and may be inspected before its removal by alkali. Specifications 617,227 and 678,321 also are referred to.

* LIGHT-SENSITIVE LAYERS FOR THE PRINTING INDUSTRY. *U.S. Patent 2,687,958.* Wilhelm Neugebauer. *Official Gazette* 685, No. 5, August 31, 1954, page 1118. 1. Light sensitive material suitable for use in the manufacture of printing plates comprising a base and a light sensitive layer thereon, said layer including a polyacrylamide in which both hydrogen atoms of the NH_2 group are substituted by alkyl radicals and an azido compound which is an alkali salt of 4,4′-diazidostilbene-2,2′ disulfonic acid.

* LITHOGRAPHIC PRINTING PLATES. S. D. Warren Company. *French Patent 1,031,702. Le Procédé* 50, Nos. 3-4, March-April, 1954, pages 30-1 (in French); *Printing Abstracts* 9, No. 6, June, 1954, page 447. A surface bearing a coating of an organic substance, e.g., gum arabic, or a sheet of paper with a more resistant backing, is treated with a solution of potassium permanganate, which is reduced by the organic substance to the state of brown hydrated manganese dioxide; the water-receptive properties of the surface are thereby improved. The permanganate solution can have added to it cupric or ferric chloride or an aqueous suspension of colloidal silica which would contribute to the graining of the surface.

* MANUFACTURE OF PHOTO LITHOGRAPHIC DIAZOTYPE PRINTING FOILS. *British Patent 707,378.* Kalle and Co. A. G. *Printing Abstracts* 9, No. 6, June, 1954, 446. The plate, consisting of a base having a hydrophilic surface, and as light-sensitive constituent a diazo com-

pound which becomes oleophilic under the action of light, is exposed to light and then provided with a water-soluble film-like coating (e.g., of dextrin).

* DIAZOTYPE LITHOGRAPHIC PRINTING PLATES. *French Patent 1,023,412.* B. Ostersetzer and W. Mauss. *Printing Abstracts* 9, No. 6, June, 1954, page 446. Printing plates prepared with the aid of an ester or amide of a sulphonic or carboxylic acid of 2-diazonaphthol-(1) or 1-diazonaphthol-(3) as sensitizer are claimed. A photoprint of this patent may be obtained from the U.S. Patent Office, Washington 25, D. C.

* MATERIALS AND PROCESSES FOR PHOTOMECHANICAL REPRODUCTION. *British Patent 706,879.* Kalle and Co. A. G. *Printing Abstracts* 9, No. 6, June, 1954, page 445. A light-sensitive material contains as light-sensitive constituent a water-insoluble azo dyestuff containing at least one residue of a o-quinone diazide in the molecule and at least one auxochromic group in addition to the azo group and which is derived from a sulphonic acid or carboxylic acid of the o-quinone diazide, the azo-dyestuff residue of the molecule being coupled in an ester-like or amide-like manner to the sulphonic acid or carboxylic acid group.

* PHOTOMECHANICAL RESIST. *U.S. Patent 2,690,966.* L. M. Minsk and W. P. Van Deusen. *Official Gazette* 687, No. 1, October 5, 1954, page 167. 1. A photomechanical resist composition comprising a polymeric material selected from the group consisting of cinnamic acid esters of polyvinyl alcohol containing at least 60 mol percent of recurring structural units having the formula

$-CH_2-CH-O-CO-CH=CH-C_6-H_5$

as a combined carrier and light-sensitive material, and as a light-sensitizing agent for the polymeric material a triphenylmethane dye containing at least one 4-aminophenyl group attached directly to the methane carbon atom of said dye.

* DIAZOTYPE PROCESSES AND MATERIALS FOR PRODUCING PHOTOMECHANICAL PRINTING PLATES. *British Patent 711,808.* Kalle and Co., A. G. *Printing Abstracts* 9, No. 9, September, 1954, page 652. The light-sensitive constituent of a coating for aluminum foil plates consists of a water-insoluble ester or amide of a sulphonic or carboxylic and of an o-diazophenol (e.g., the diazo compound from 2-amino-1-hydroxylbenzene-4-(N:N-diphenyl-sulphonamide).

* DEVELOPMENT OF DIAZO AND AZIDE SENSITIZED COLLOIDS. *U. S. Patent 2,690,968.* A. J. Powers, Jr. *Official Gazette* 687, No. 1, October 5, 1954, pagees 167-168. 1. In the process of developing an exposed sheet of colloidal material capable of being tanned and sensitized with a compound containing the —N:N— group which compound is decomposed on exposure to light to tan the colloidal material and to release gaseous nitrogen, said developing being done by washing with water, the improvement comprising the step of subjecting the exposed sheet to suction prior to the washing of the sheet with water, said suction being of such degree and duration as to remove the gaseous nitrogen from the colloidal material of the sheet.

*DIAZOTYPE PRINTING PLATES. *German Patent 888,204.* O. Süss. *Photographic Abstracts* 34, Part 2, 1954, page 101. The synthesis of a number of diazonium compounds of o-quinonediazide sulpho or carboxylic acid amides and esters is described. The compounds are dissolved in a solvent boiling between 70 and 100° C., e.g. dioxane, and coated on a suitable paper support, zinc or aluminum foil.

An alkali soluble resin may be added to the solution or applied as an interlayer. After exposure, development by an alkaline solution, e.g. trisodium phosphate, and acid aftertreatment e.g. with 1 per cent phosphoric acid, enables the unexposed areas of the plate to absorb greasy inks. The adhesion between image and plate can be improved by heating to 250° C. A photoprint of German Patents may be obtained from the U.S. Patent Office, Washington 25, D. C.

* PROCESSES AND MATERIAL FOR USE IN PRINTING, WITH THE APPLICATION OF DIAZO COMPOUNDS. *British Patent 708,834.* Kalle and Co., A. G. *Printing Abstracts* 9, No. 8, August, 1954, page 592. A diazo compound of the general formula: where X stands for

N_2SO_2—A.Ar, CO—O.Ar, SO_2—NY.Ar or CO—NH.Ar^2, Ar an aromatic residue, and Y hydrogen or an aliphatic or aromatic X residue

is claimed as the light-sensitive constituent of a light-sensitive layer for the production of lithographic printing plates.

* PRINTING SURFACES. *British Patent 678,097.* E. W. Rollinson. *Abridgement of Specifications* XVI, 1954, page 216. An aluminium planographic printing plate which may be imaged both by direct marking (by typing, or by hand with crayon, ink, etc.) and photographically, has an integral roughened surface of average topography the equivalent of 35-80 micro-inches R.M.S. as measured by a specified form of surface analyzer, uniformly coated with anodic aluminium to a thickness of 2.4 to 3.5 milligrams per sq. in.

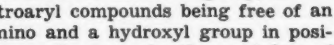
A NEW SOLVENT SOLUBLE RESIST FOR LITHOGRAPHY. L. E. Martinson. *TAGA Proceedings,* Sixth Annual Meeting, 1954, pages 33-38 (6 pages). Modern lithographic printing has for the most part been concerned with properties and problems of water-soluble resist materials which have been made light-sensitive with bichromates. Shortcomings of such systems are well known and are presented along with some modern trends. New data are presented concerning properties of a new solvent-soluble resist material called Kodak Photo Resist. The new material can be described as a light-sensitive lacquer; the light sensitivity is obtained through an inherently light-sensitive organic molecule. Tone-reproduction curves are shown for this resist and for another commercially available surface coating. Copies of the Proceedings may be obtained from the Secretary-Treasurer, George Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Mass. for five dollars.

THE USE OF COPPER AS A MODIFYING AGENT IN PLATE LACQUERS. G. C. Beutner. *TAGA Proceedings,* Sixth Annual Meeting, 1954, pages 71-75 (5 pages). Recently there has been a great deal of interest expressed in chemically deposited copper as an image base. On zinc plates the copper has been deposited from an alcoholic cuprous chloride solution followed by the application of a vinyl lacquer. The logic of such a sequence is doubtful. A new method is suggested that involves the *simultaneous* deposition of copper and vinyl lacquer. Modifications in lacquer formulation are necessary to produce optimum results. Briefly, then, the paper describes some of the work done to effect an optimum formulation. Also, the practical ramifications of simultaneous deposition are discussed. Copies of the Proceedings may be obtained as stated in the preceding abstract.

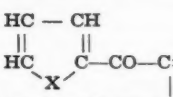
* PHOTOMECHANICAL RESIST COMPOSITIONS. *British Patent 713,947.* L. M. Minsk, W. P. Van Deusen and E. M. Robertson. *Printing Ab-*

stracts 9, No. 10, October, 1954, page 713. The resist consists of a solution in an organic solvent of a cinnamic acid ester of polyvinyl alcohol and, as an agent to increase its sensitivity, a benzene or naphthalene compound containing 1 to 3 nitro groups attached to the benzene or naphthalene nucleus, but free from amino, hydroxyl and formyl groups in the position *ortho* to the nitro group, all the nitroaryl compounds being free of an amino and a hydroxyl group in positions ortho to each other and free of carboxyl and sulpho groups.

* PROCESS OF PHOTO MECHANICAL REPRODUCTION. Kalle and Co. A. G. *British Patent 712,991. Printing Abstracts* 9, No. 10, October, 1954, page 713. A support is coated with a solution of a light-sensitive unsaturated ketone having the carbon atom grouping



in which x and y stand for 0, 1, 2 or 3, it being provided that the sum of x+y equals at least two of the groupings



where X in each case stands for O, S or NH. If a quinone or a dyestuff belonging to the thiazine series is added to the light-sensitive solution, the light-sensitive material can be stored for a longer time.

CHARACTERISTICS OF PVP FOR LITHOGRAPHY. H. A. Beechem. *Graphic Arts Monthly* 26, No. 10, October, 1954, pages 106, 108 and 110 (3 pages). Describes properties and use of polyvinylpyrrolidone. Has been used in deep-etch coatings that have been sensitized with both dichromate and diazos. Only a limited amount of work has been done on the use of PVP in lithography.

*PROCESS OF DEVELOPING PHOTOLITHOGRAPHIC PRINTING PLATES. *U.S. Patent 2,692,827.* F. E. Brinnick. *Official Gazette* 687, No. 4 October 26, 1954, page 854. 1. Process which comprises exposing to actinic radiation a paper base having a surface sensitized with a coating of a photosensitive composition comprising a member of the group consisting of diazo compounds of the general formula R—Y—Ar—N_2—X wherein R stands for a member of the group consisting of alkyl, aralkyl, aryl and aroyl, Y stands for a member of the group consisting of O, S, NH, N-alkyl, N-aralkyl and N-aryl, Ar stands for aryl and X stands for an equivalent of an anion of an acid, the amino derivatives of said diazo compounds, the sulfonates of said diazo compounds, the reaction products of said diazo compounds and carbonyl compounds; and the sulfonates of said reaction products of said diazo compounds and carbonyl compounds; treating the exposed surface with a nonpenetrating substance from the group consisting of powdered water-insoluble metal soaps, powered water-repellent dyestuffs, oleic acid, vegetable oils, liquid silicones of viscosity as high as that of oleic acid, and turpentine polymerized to a high viscosity; washing the surface with water; and printing copies from the treated surface by the offset printing process.

* LITHOGRAPHIC PLATES. *U. S. Patent 2,692,826.* W. Neugebauer, A. Rebenstock and T. Scherer. *Official Gazette* 687, No. 4, October 26, 1954, page 854. The process for the preparation of lithographic plates comprising the steps of coating a flexible metallic base with a solution containing polyvinylpyrrolidone and 4,4′-diazidostilbene-2,2′-disulfonic acid sodium salt to form a light sensitive colloid layer which can be tanned by light, exposing said light sensitive colloid layer to a light image, removing from the base material those por-

tions of the colloid layer not struck by light and heating the plate to a temperature of 200° C. to 400° C. to transform said tanned images into a firmly adherent greasy ink receptive layer.

METAL LITHOGRAPHIC PLATES PREPARED BY XEROGRAPH. O. A. Ullrich, L. E. Walkup and R. E. Rossell. *TAGA Proceedings*, Sixth Annual Technical Meeting, 1954, pages 130-138 (9 pages). At the TAGA meeting in Rochester, New York, in April, 1950, the use of xerography for preparing offset-duplicating paper plates was described. Such plates can be made in a few minutes using only a dry powder and simple procedures. This method is receiving widespread commercial acceptance. It now can be reported that, in the laboratory, metal lithographic plates can be prepared by xerography which produce results that are considerably superior to the results obtained from paper plates prepared by xerography. In fact, such plates appear good enough for use in printing military topographic maps. At present, the process is suitable only for reproducing line subjects, and additional work will be required before they can be used for halftone reproduction. In this process, an electrostatic image is created on a selenium-coated plate by exposure to a light image. This electrostatic image is "developed" with a dry powder, and the powder image is transferred electrostatically and fixed to a grained zinc plate. The entire operation can be completed in about five minutes. Plates as large as 27 by 30 inches have been made and larger sizes should present no insurmountable difficulties. TAGA Proceedings may be purchased for five dollars each from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Massachusetts.

*SENSITIZATION OF PHOTOMECHANICAL RESISTS. *U.S. Patent 2,666,701*. W. West. *Photographic Abstracts* 34, Part 3, 1954, page 171. Optical sensitization of photomechanical resists containing hardenable keto compounds is effected by the inclusion of a dye which may be a thiacarbocyanine, dibsenzothiacarbocyanine, thiazolocarbocyanine, selenacarbocyanine or azathiacarbocyanine.

*LITHOGRAPHIC PLATES. *British Patent 714,171*. The Printing, Packaging, and Allied Trades Research Association. *Tin Printer and Box Maker* 30, No. 359, December, 1954, page 14. A lithographic plate is provided with a non-printing surface consisting of or comprising a phosphide of nickel or cobalt.

*LITHOGRAPHIC PRINTING PLATE. *British Patent 716,402*. Algraphy, Ltd. *Tin Printer and Box Maker* 30, No. 359, December, 1954, page 14. A plate is formed wholly of, and has a surface consisting of, aluminium, or an aluminium alloy capable of having formed thereon, by an oxidising process, a hard resistant oxide coating, the printing surface being anodised. The printing areas are formed by copper or other ink-accepting material deposited in the anodic coating.

*LITHOGRAPHIC PRINTING PLATE AND METHOD OF MAKING. *U.S. Patent 2,693,145*. W. G. Mullen. *Official Gazette* 688, No. 1, November 2, 1954, page 93. 1. The method of making a direct image lithographic plate comprising the steps of coating a support with a hydrophilic colloid composition containing an insolubilizing agent in an amount sufficient partially to insolubilize and harden the colloid coating to a water-soluble, water-sorptive stage and an opaquing substance to limit penetration of light therethrough, incorporating a light sensitive colloid insolubilizing substance in the colloid coating, exposing the entire surface of the applied coating uniformly to light for

a time sufficient to react the surface portion of the coating to an advanced stage of insolubilization but insufficient to convert the hydrophilic surface of the coating to a water repellent, ink receptive stage, and then washing the colloid coating to eliminate unreacted light sensitive colloid hardening substance for stabilization of the coating.

*LITHOGRAPHIC MATERIAL AND PROCESS. *U.S. Patent 2,696,435.* W. Neugebauer and M. Tomanek. *Official Gazette* 689, No. 1, December 7, 1954, page 160. A light sensitive material suitable for making printing plates comprising a flexible sheet metal base coated with a thin, firm and uniform layer of an unsaturated sulfone having the general formula:

R_1–SO_2–CH=CH–CH=CH–R_2

in which R_1 and R_2 are selected from the group consisting of aromatic residues and substituted aromatic residues.

DESENSITIZING AGENTS FOR OFFSET. Alf Arnamo. *Grafiska Forskningslaboratoriet* No. 35, November, 1954, pages 10-11 (2 pages) (in Swedish, abstract only in English). Different organic materials of suitable structure have been tested as base materials for the preparation of desensitizing agents. A mixture of specially chosen starches, which was treated with alkali, gives a reaction product with very good desensitizing properties. The product was tested at the laboratory and in practice and compared with other used agents, as gum arabic. The new agent was thereby found to be superior to the other agents.

*DEVELOPING OF DIAZO AND AZIDE SENSITIZED COLLOIDS. *U. S. Patent 2,695,846.* J. P. Mally, *Official Gazette* 688, No. 5, November 30, 1954, pages 981-2. 1. In the process of developing with water an exposed sheet of colloidal substance capable of being tanned sensitized with a tanning compound containing the --N:N-- group which is decomposed on exposure to light to release nitrogen gas, the step of subjecting the exposed sheet to a surface treatment with a relatively pure monohydric alcohol selected from the group consisting of methanol and ethanol, prior to the wetting of the sheet with water.

*PHOTOGRAPHICALLY PRESENSITISED METAL PLATES. *British Patent 718,525.* C. L. Jewett and J. M. Case. *Printing Abstracts* 10, No. 1, January, 1955, page 30. An ungrained base plate (e.g., degreased aluminum foil) is treated with an aqueous solution of a hydrophilic inorganic material (e.g., sodium silicate) and then coated with a thin coating of a water soluble light-sensitive diazo material of such a nature that, on exposure to ultraviolet light, the exposed portions will form a litho image firmly bonded to the base plates

*STABILIZATION OF SYNTHETIC POLYMER-SENSITIZED ZINC LITHOGRAPHIC PRINTING PLATES. *U.S. Patent 2,691,584.* J. G. Smith and L. M. Minsk. *Official Gazette* 687, No. 2, October 12, 1954, page 392. A light-sensitive photographic element comprises a zinc plate coated with a mixture of polyvinyl cinnamate containing from 60 to 100 mol. % of recurring polymeric units having the formula:

–CH_2–CH–O–CO–CH=CH–C_6H_5

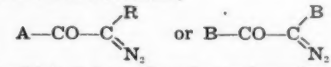
and an amount of hydroquinone and an organic acid sufficient to prevent the formation only in the dark of insoluble reaction product immediately adjacent to the surface of the zinc plate

*QUINONEDIAZIDE PRINTING PLATES. M. P. Schmidt, O. Sus and W. Müller. *German Patent 900,172. Photographic Abstracts* 34, Part 3, 1954, page 172. Water insoluble

o-quinonediazides which are bleached by exposure to light are dissolved in an organic solvent and coated on a support, e.g., roughened aluminum. In addition to larger substituents to render them water-insoluble, e.g., a naphthyl group, the azides carry solubilizing substituents so that their photodecomposition products can be removed by means of an alkaline solution, e.g., a trisodium phosphate solution. A dye may be added to the azide solution or the developed image heated to deepen its color. The image accepts greasy ink. German Patents may be obtained as photoprints from the U.S. Patent Office, Washington 25, D. C.

* IMINOQUINONEDIAZIDE PRINTING PLATES. *German Patent 901,500.* M. P. Schmidt and O. Sus. *Photographic Abstracts* 34, Part 3, 1954, page 171. Iminoquinonediazides, which are more or less water-insoluble, differ from their photodecomposition products in solubility. As both accept greasy ink, they can be employed for obtaining either positive or negative printing plates. The diazides are dissolved in an organic solvent having a boiling point between 70 and 120° C., e.g., glycol monomethyl ether, and are coated on a paper or metal support. Addition of a resin inhibits crystallization and improves adhesion (cf. British Patent 711,626). German Patents may be obtained as photoprints from the U.S. Patent Office, Washington 25, D. C.

* PRESENSITIZED LITHOGRAPHIC PLATES. *German Patent 901,129.* W. Neugebauer and O. Sus. *Monthly Abstract Bulletin* 40, No. 8, August, 1954, page 348. Lithographic plates can be sensitized with diazoketones of the formula,



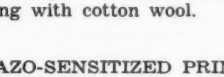
in which A is a phenyl, a polynuclear aromatic, or a heterocyclic radical with electron-attracting substituents such as $—NO_2$, —CO-aryl, $—SO_2$-NH-aryl, etc., and with electron donating substituents such as halogen, alkyl, or alkoxy groups; R is hydrogen or alkyl, and B and B′ are aryl radicals which may be substituted. Examples are the diazoketone of p-nitrobenzoic acid and 4:4′-dinitrodiazo-desoxybenzoin. German Patents may be obtained as photoprints from the U.S. Patent Office, Washington 25, D. C.

* PRESENSITIZED LITHOGRAPHIC PLATES. *German Patent 903,529.* W. Neugebauer and M. Tomanek. *Monthly Abstract Bulletin* 40, No. 8, August, 1954, page 349. Lithographic plates can be sensitized with unsaturated aldehydes of the formula, $R\text{-}(CR_1{=}CR_2)_X\text{-}CHO$, in which R is an aromatic or jeterocyclic radical which may be substituted; R_1 and R_2 are hydrogen, halogen, alkyl, or an aromatic radical; and x is 1 or 2. For example: A solution of 1% cinnamaldehyde and 1% 4-nitrocinnamaldehyde in glycol monomethyl ether is coated on a mechanically grained aluminum sheet, dried, exposed through a negative, swabbed with 2% phosphoric acid, and inked to give a positive offset printing plate. German Patents may be obtained as photoprints from the U.S. Patent Office, Washington 25, D. C.

* OFFSET PRINTING PLATES. *U. S. Patent 2,687,373.* H. Hering. *Chemical Abstracts* 29, No. 2, January 25, 1955, Column 1245. The stability of stored offset plates of aluminum, zinc or their alloys is improved by neutralization of the acid residues left in the plate pores during anodizing, followed by application of a protective layer of MgO. The quality of the plates so prepared is better than that of Solnhof natural stone. Their surfaces are made porous by electrolytic treatment with low-voltage a.c. They are dipped for $\geqq$ 5 minutes in 16° Baumé NH_4OH and then submerged

for 15 minutes in a constantly stirred mixture of 1 kg. calcined MgO (sufficient for 50 sq. m.) and 1000 kg. CCl_4 or CH_3-CCl_3. The plates are dried with ventilation at $\leqq$ 30° and coated with a sensitive layer. After copying and developing, the MgO layer is cleared of unhardened sensitive material by the action of a fine jet of water. The porous metal is bared by swabbing with cotton wool.

* DIAZO-SENSITIZED PRINTING PLATES. *British Patent 708,446.* W. Neugebauer, J. Barthenheier and A. Rebenstock. *Photographic Abstracts* 34, Part 4, 1954, page 241. Lithographic printing plates sensitized with diazonium compounds of formula



where R is an aryl residue, R_1 is hydrogen or alkyl, Ar is a phenylene residue and X is an anion residue, which become printing ink acceptors after exposure, are fixed by washing out most of the unexposed diazonium compound and treating the residual unexposed diazo compound with a water-soluble azo coupling component containing one hydrophilic group with which it forms a hydrazo dye which will not accept greasy ink.

* DIAZO-SENSITIZED PRINTING PLATES. *British Patent 709,453.* Kalle and Co. A. G. *Photographic Abstracts* 34, Part 4, 1954, page 241. Photolithographic materials containing diazo materials which become oleophilic on exposure to light are, after exposure, rubbed with greasy ink in the presence of water and then coated with a water-soluble film-forming substance such as dextrine and exposed. The previously unexposed areas are rendered hydrophilic by exposure under the film and the image is thus permanently fixed. The film-forming substance is removed and the plate prepared for printing.

* ELEMENTS FOR PHOTO-LITHOGRAPHY. *British Patent 694,224.* Kodak, Ltd. *Abridgement of Specifications* XX, 1955, pages 232-233. Unsensitized elements for sensitization shortly before use, or which may be pre-sensitized and so stored, comprise a metal foil such as zinc or aluminum and a layer of cellulose organic ester, usually the fully esterified acetate, bonded together by an interlayer comprising a copolymer of vinyl chloride, vinyl acetate and an $\alpha:\beta$ ethylenically unsaturated dicarboxylic acid such as maleic or fumaric acid, the cellulose organic ester layer containing an anti-halation dye and having a hydrolysed stratum on the outer surface thereof, and the metal foil having its outer surface covered with a protective layer of the same copolymer. The protective layer may carry a further layer of dyed cellulose organic ester, which itself may have a hydrolysed outer stratum. In a modification the anti-halation dye may be contained in a layer of cellulose nitrate situated between the copolymer interlayer and the said cellulose organic ester layer. The cellulose organic ester layer may be provided by use of a preformed sheet of this material or by solvent coating procedure, and the copolymer layer provides secure adhesion to the reinforcing metal foil, and protection of the latter from alkali used for surface hydrolysing the cellulose ester. The anti-halation dye is a blue and ultraviolet absorber. The hydrolysed cellulose ester stratum or both of them may be sensitized by the methods of Specifications 617,227, 678,321 or 678,323. Two examples are given.

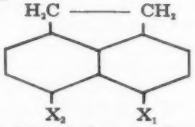
* PHOTOMECHANICAL PROCESSES AND LIGHT SENSITIVE DIAZOTYPE MATERIALS THEREFOR. *British Patent 715,663.* Kalle and Co. A. G. *Printing Abstracts* 9, No. 11, November, 1954, page 779. The light-sensitive constituent is a quinone- (1:4)-diazide which is diffi-

cultly soluble or insoluble in water and soluble in an organic solvent. Preferably a quinone-(1:4)-diazide of the benzene or naphthalene series is used which is difficultly soluble or insoluble in water and which contains at least one esterified or amidated sulphonic acid or carboxyl group as a substituent in the molecule

* PHOTOSENSITIZED MATERIAL FOR PHOTOMECHANICAL REPRODUCTION. *Belgian Patent 521,631.* Kalle and Co. A. G. *Monthly Abstract Bulletin* 40, No. 10, October, 1954, page 440; *Printing Abstracts* 10, No. 3, March, 1955, page 152. Presensitized lithographic printing plates are prepared by coating a suitable support, such as aluminum foil, with an alkali-soluble resin consisting of an alkyl-, alkoxy-, nitro-, hydroxyl-, or carboxyl-substituted nitronaphthalene -sulphonic acid ester or amide, e.g., 1-methyl -5- nitronaphthalene -4- sulphanilide. Amides and esters containing several nitronaphthalenesulphonyl radicals, e.g., p:p¹ -bis (1:8-nitronaphthalene-sulphamido) diphenylmethane, are more photosensitive than the simpler molecules. After exposure through a negative, the printing plate is developed with a dilute alkaline solution, e.g., 3% aqueous trisodium phosphate.

* LIGHT-SENSITIVE REPRODUCTION MATERIAL AND PROCESSES FOR PRODUCTION OF COPIES THEREFROM, ESPECIALLY PRINTING PLATES. *British Patent 717,321.* Kalle and Company, A. G. *Printing Abstracts* 9, No. 12, December, 1954, pages 844-845. A support is coated with two superimposed light-sensitive layers. The layer nearer the support contains a water-insoluble diazo compound, which has the constitution of an ester or amide of a sulphonic or carboxylic acid of an ortho-diazo-phenol of the benzene or naphthalene series as light-sensitive constituent and the superimposed outer layer is a hydrophile colloid layer containing light-sensitive material which on exposure exhibits a tanning action upon the colloid.

* PRESENSITIZED LITHOGRAPHIC PLATES. *German Patent 885,189.* M. Tomanek and W. Neugebauer. *Monthly Abstract Bulletin* 40, No. 7, July, 1954, page 286; *Printing Abstracts* 9, No. 12, December, 1954, page 845. Lithographic plates are sensitized with one or a mixture of the following:



in which X_1 is halogen, nitro, alkoxy, acylamino, acyloxy, or an acyl (COR), in which R is aryl, alkyl, or arlkyl; and X_2 is hydrogen or one of the aforementioned groups. For example, 2% of 6-nitro-5-benzoylacenaphthene in glycol monomethyl-ether is coated on a mechanically grained aluminum plate, dried, exposed through a halftone or line negative, developed with 5% phosphoric acid in 5% ethanol, and inked to give a positive offset printing plate.

* PRINTING SURFACES. S. D. Warren Company. *British Patent 692,387. Abridgement of Specifications* XVI, 1955, pages 158-9 A planographic printing plate comprises a paper base having thereon a planographic printing surface layer comprising insoluble hydrophilic adhesive material and finely divided inert mineral pigment and having therein capillary interstices and pores containing the evaporation residue of an aqueous solution containing a water-soluble multivalent metal salt and the evaporation residue of an aqueous solution containing a water-soluble monovalent salt of the group consisting of the alkali metal and ammonium salts of acids capable of forming water sol-

uble salts with the multivalent metal. The multivalent metals may be one of the group aluminum, chromium, iron, uranium and zirconium and the multivalent metal salt and monovalent salt may be salts of the aliphatic organic acids of the group formic acid and acetic acid. The solutions of the multivalent and monovalent salts may be applied successively in either order or together to the dried hydrophilic coating or may be incorporated in and applied with such coating. Specifications 633,746, 633,747 and 633,796 are referred to.

*ETCHING; PRINTING SURFACES. *British Patent 705,053.* D. J. Black (to Coates Bros. and Co., Ltd.). *Abridgement of Specifications* XVI, 1955, page 76. A chromium-surfaced copper, brass or zinc plate or cylinder is etched through a developed photographic line or halftone resist with a first etching liquid which attacks the chromium but not the underlying metal and then with a second etching liquid which attacks the underlying metal but not the chromium. The result is, normally, an intaglio printing surface but if the underlying metal is only moderately deeply etched printing may be effected by lithographic means using the ink-refusing and water-accepting properties of chromium. For a chromium plated copper sheet the first etching liquid may be dilute hydrochloric acid which may be modified with glycerin and the second etching liquid dilute nitric acid or calcium, ferric or zinc nitrate and such may be used before or after removal of the photographic stencil. Specification 475,902 is referred to.

*BICHROMATED COLLOID PLATE FOR PLANOGRAPHIC PRINTING. *British Patent 699,052.* A. Tickner (to Columbia Ribbon & Carbon Mfg. Co., Inc.). *Abridgement of Specifications* XX, 1955, page 312. A plate has a paper foundation, an insolubilized coating of a carboxymethyl cellulose compound therein and, adhering to the surface of the latter, a bichromated albumin coating. The plate may be exposed under a negative, if desired using a halftone screen, and washed to remove unexposed areas, or, after exposure, may be coated with asphalt or gilsonite solution and submerged in dilute aqueous ammonia; to produce a planographic printing plate in which the ink-receptive portions penetrate sufficiently into the carboxymethylcellulose to remain firmly bonded thereto during printing operations. Preferably the paper foundation is made resistant to swelling or deformation, as by incorporating a melamine- or urea-formaldehyde resin in the pulp used for making the paper or by coating the paper with a waterproof lacquer such as a polystyrene resin in a solvent, or a casein-formaldehyde solution. An aqueous solution of an alkali salt or an ammoniacal aluminum salt, of carboxymethyl cellulose, and which may contain up to 20 per cent of other colloids such as sodium alginate, alkali casein, or zein and also a filler such as colloidal clay and a plasticizer such as glycerin, is applied in one or more coatings to the paper and insolubilized as by treatment with a copper, ferric or chromic salt, glyoxal, or a strong acid solution or by evaporating off ammonia when this is used. After drying bichromated glue or egg albumin is applied as by whirl coating and then exposure and processing are by normal methods. Four examples provide quantitative details. The use of coatings of casein-formaldehyde, polyvinyl alcohols and carboxymethylcellulose compounds for similar purposes is referred to.

*PRINTING SURFACES. *British Patent 692,367.* W. C. Toland, M. H. Hamilton and A. P. Reynolds. *Abridgement of Specifications* XVI, 1955, page 158. A lithographic printing plate comprises a base, e.g. a paper coated with a water repellent resin, a coat-

ing on the base, greasy image portions fixed to the coating, the coating including a water-swellable material, melamine-formaldehyde resin and a water-soluble organic dibasic acid which is dispersed throughout the coating in a finely divided solid state. The water-swellable material may include polyvinyl alcohol or natural colloids such as gelatin, glue, gum arabic, or Irish moss, and the water-soluble organic dibasic acid is a water-soluble dicarboxylic acid, e.g. oxalic, fumaric, succinc, or tartaric acid. The coating also includes fillers such as clay and Blanc Fixe. An intermediate colloidal layer, e.g. a mixture of polyvinyl alcohol, formaldehyde, Blanc Fixe and clay, may also be employed to assist in bonding and prevention of scum formation. Both the melamine-formaldehyde resin and the dicarboxylic acid are dispersed in a finely divided state throughout the coating so that the resin forms hard, water impervious masses throughout the coating thus presenting a number of highly grease retentive anchor points to which a greasy typewritten image or character may be attached, the intermediate areas being grease repellent. It is stated that the acid, by releasing hydrogen ions which diffuse to the surface of the plate, prevents ink emulsification and controls swell of the colloid. Specification 692,-366 is referred to.

* ETCHING. *British Patent 705,-004.* Dow Chemical Company. *Abridgement of Specifications* XVI, 1955, 76. An etching bath for etching an acid-soluble metal, e.g. in making a printing plate, comprises a mixture of a saturated aliphatic acid having from 5 to 26 carbon atoms in the molecule and an aqueous solution containing nitric acid. The aqueous solution may contain from 3 to 50 per cent of nitric acid by weight and the amount of the aliphatic acid is from 0.05 to 4 times that of the nitric acid by weight. The inclusion of the aliphatic acid in the etching solution produces an acid resistant film that exerts a controlling effect on the dissolving action of the nitric acid by substantially reducing the action of the nitric acid in a lateral direction whilst not adversely affecting the depth of the etch. The parts of the plate to be left unaffected are coated in the usual way with a resist and the etching solution is splashed on the plate or caused to impinge thereon by an atomizing nozzle. A concentration of from 5 per cent to 10 per cent of nitric acid is preferred. Examples of suitable saturated aliphatic acids given are valeric acid, caprylic acid, stearic acid, palmitic acid, lauric acid, and cerotic acid. The aliphatic acids used are those which are relatively insoluble and are normally liquid or become liquid at moderately elevated temperatures.

CHEMISTRY

* PHOTOMECHANICAL RESIST COMPOSITIONS. *British Patents 717,708; 717,710-717,712* (A, C, D, E) (Addition to British Patent 695,197); *717,709* (B) (Addition to British Patent 695,262). L. M. Minsk, W. P. Vandeusen and E. M. Robertson (A, C, E); L.M. Minsk (B); L.M. Minsk and E. M. Robertson (D). *Printing Abstracts* 10, No. 1, January, 1955, page 30. A. A substituted mononuclear quinone or a substituted or unsubstituted polynuclear quinone, the quinone being free from carboxyl groups, sulpho groups and basic nitrogen-containing and hydroxyl groups in the *peri* and *ortho* positions to an oxocarbonylic group, is used to increase the sensitivity of photomechanical resist compositions consisting of a solution of a light-sensitive cinnamic acid ester of polyvinyl alcohol or of cellulose in an organic solvent. B. A method of preparing cinnamic acid esters of polyvinyl alcohol is claimed. C. The sensitivity of these esters is increased by a compound of the general formula:

(where R and R^1 are aryl groups of the benzene series, X and Y are either hydrogen, or X is hydrogen and Y is a hydroxy group, or X and Y together represent O, NOH, NH or S. Examples are diphenyl ketone, 4:4¹-diaminodiphenyl ketone, 4:4 -tetramethyldiaminodiphenyl ketone, diphenylmethane, 4:4¹-tetramethyldiaminodiphenylmethane, 4:4¹-tetramethyldiaminodiphenyl carbinol compound, and 4:4¹-tetramethyldiaminobenzophenone imide. D. A triphenylmethane dye is claimed as sensitizer. E. Anthrone, benzanthrone or azabenzanthrone compounds free of basic nitrogen-containing substituents and hydroxyl in a position *peri* or *ortho* to an oxo-carbonylic group of the compound, carboxyl and sulpho groups are claimed as sensitizers.

METAL SURFACES

PHOSPHORUS-NICKEL ALLOYS FOR LITHOGRAPHY. R. A. C. Adams. *Penrose Annual* 48, 1954, pages 124-126. Phosphorus-nickel alloys containing more than 12% phosphorus plated on copper or brass give a deposit which is of the same order of hardness as chromium, is readily wetted by water and is not attacked by hydrochloric and sulphuric acids, by strong alkalis or other chemical reagents. Owing to its inertness it is impossible to make it ink-receptive by traces of fatty acids in the ink. So far it has only been possible to etch it electrolytically. Other difficulties in processing the plates are indicated.

* METHOD OF TREATING ALUMINUM SHEETS FOR USE AS PRINTING SURFACES ON OFFSET PRESSES. *U. S. Patent 2,687,373* Willy Hering. *Marathon Graphic Arts Abstracts* 1, No. 9, September, 1954, page 119. The procedure comprises electrolytic (anodic) treatment of the sheet with a low voltage alternating current to obtain thereon a surface layer of porous aluminum oxid. The sheet then is treated with ammonium hydroxid solution to neutralize residual acid in the pores, whereupon these are closed by depositing therein a volatile organic solvent dispersion of magnesium oxid by evaporation of the volatile solvent, after which a coating of sensitizer can be applied to the treated surface.

* METHOD OF MAKING PLANOGRAPHIC PRINTING SHEETS. *U.S. Patent 2,684,922*. O. B. Pollock, C. L. Wilson and M. H. Pintell. *Printing Equipment Engineer* 85, No. 1, October, 1954, page 63. The method uses a selected light gauge metal foil such as zinc, aluminum, copper, etc., which is surfaced by means of a rapidly rotating brush having filaments of special form which have a primary hammer-displacing action and a very minor metal removing action. By such process, minute oriented depressions are formed regularly spaced across the surface of the metal. The depressions are greater in dimension in one direction. The surface of the plate is subjected to an aqueous solution of an alkali metal phosphate to effect the formation of a thin layer of metal phosphate on the plate.

DURADISED PLATES. *Modern Lithographer and Offset Printer* 50, No. 10, October, 1954, pages 29-30 (2 pages); *Printing Abstracts* 10, No. 1, January, 1955, page 27. The process of duradising aluminum sheet is based on the electrolytic oxidation of the plate surface forming a comparatively thick film of aluminum oxide over the whole plate area. The surface is very hard and water receptive. In processing, the surface is etched through the base metal for the image-bearing areas. The plates are claimed to be virtually indestructible and to produce good quality work. (Howter Dura-

plate plates are etch are available from W. H. Howson Ltd., The Mint, Holbeck, Leeds 11, England.)

POLYMETALLIC

*ETCHING COMPOSITION FOR LITHGRAPHIC PLATES. *U.S. Patent 2,687,345.* Margaret Murray. *Official Gazette* 685, No. 4, August 24, 1954, pages 877-878. 1. A composition capable of etching chromium and adapted for use in the preparation for offset printing of bimetal lithographic plates having a chromium surface and a gelatinous resist coating, said composition comprising hydrochloric acid in an amount to etch chromium, calcium chloride in an amount of at least about 80% to inhibit attack of the resist by hydrochloric acid and an aliphatic polyhydric alcohol having from two to four carbon atoms in an amount of at least 5% to substantially prevent crystallization of calcium chloride at the etching temperature.

*APPARATUS FOR PLATING CHROMIUM. *U.S. Patent 2,684,939.* C. F. Geese. *Printing Equipment Engineer* 85, No. 1, October, 1954, page 63. This is useful in the manufacture of lithographic printing plates wherein chromium is applied to portions of plates which are to be water receptive and ink repellent, comprises a rigid non-conductive tip containing a hollow reservoir for plating solution and has a capillary opening connecting with reservoir for gradually releasing the solution by the movement of the tip against a surface to be plated. An elongated anode within the tip has an end adjacent the opening. Extremity of the tip has slots intersecting and extending away from opening to vent gases formed by electrolysis.

WORKING WITH BI-METAL PLATES. *Modern Lithographer and Offset Printer* 51, No. 1, January, 1955, pages 21-23 (3 pages). A discussion of the two general types of bi-metal plates "deep-etch" (printing metal is the base) and "surface" (printing metal is plated). The author feels that a plate with a slight grain is advantageous from the press standpoint.

*ETCHING. *British Patent 689,338.* Interchemical Corporation. *Abridgement of Specifications* XVI, 1955, pages 115-116. An etch for use in making lithographic printing plates which will dissolve chromium without attacking copper, and which has only a slow action on a light-hardened bichromated gum arabic film, consists of a concentrated aqueous solution of calcium or magnesium chloride, a minor proportion of a concentrated solution of a stannic or chromic salt, and a small amount of acid sufficient to reduce the pH to below 2.0. The stannic or chromic salt is preferably the chloride. The acid is present to the extent of about 2 liquid ounces per gallon of the calcium or magnesium chloride solution, and may be hydrochloric, nitric, sulphuric, acetic, phosphoric, lactic, hydroxyacetic, citric, oxalic or tartaric acid or resorcinol may be used. 3 examples are given. Patent Specification 640,655 is referred to.

*A CHART OF POLYMETAL OFFSET PLATES. G. Wever. *Intergrafia* 4, No. 35, October 25, 1954, pages 768-72 (in Dutch); *Printing Abstracts* 10, No. 1, January, 1955, page 31. Eleven types of poly- and bimetallic plates are set out in a chart with name of plate, type of metal and method of working. Intergrafia is published at Warmoesstraat 151, Amsterdam-C., Holland.

*DISPLACEMENT COPPERING OF OFFSET PLATES. *U.S. Patent 2,703,295.* M. S. Kantrowitz and A. E. Yelmgren. *Chemical Abstracts* 49, No. 10, May 25, 1955, column 7156. A stencil (10% polyvinyl alcohol sensitized with 4 parts of 20% $(NH_4)_2Cr_2O_7$ so-

lution) is whirled dry on a zinc plate, exposed under a positive for 3-5 min., by a 20,000-amp. arc lamp at 6 ft., developed by deep etch or 50% alcohol solution, (and hardened as needed) is enflowed, sprayed, or brushed with a freshly mixed solution (5 parts of 20% neutralized $CuSO_4$ or other cupric salt, 7 parts 10% pyrogallol or other reductive developer chemical, e.g. Metol, and 1 part 28% NH_4OH or other amine or ammonium alkyl base solution) until an adherent bright-plate image forms (1 min.). The washed acetone-dried adherent deposit is lacquered, redried, and then a light developing ink is applied. The plate is then pickled in 10% citric acid (3 min.) so the stencil can be swabbed off with cotton. The bimetallic plate remaining is cleaned and optionally sensitized with 1% H_3PO_4 for immediate use or else gummed for storage. Unclean copy can be trimmed with Colitho or corrected with a similar fountain etch. The offsets have sharp dot-line formation, do not bear corrosion marks or sanding scratches, and can be made in the print shop without the use of specialized equipment or hazardous processing.

GRAINING

* METHOD AND APPARATUS FOR GRAINING LITHOGRAPHIC PLATES. *U.S. Patent 2,669,810.* E. G. Carlson and A. H. Eppler. *Official Gazette* 679, No. 4, February 23, 1954, page 853. 4. In a plate graining machine the combination with a rectilinear track and a carriage movable on said track, said carriage being provided with bearings, of a cylindrical drum mounted for rotation on an axis parallel to the track in the bearings, means at one position along the track for rotating said drum, a nozzle mounted proximate the track at said position for rectilinear traversing movement respecting the drum and means for traversing the nozzle, means of supplying to the nozzle fluid-borne abrasive, and means for forceably jetting said abrasive from the nozzle toward the drum.

GRAINING MATERIALS PAST AND PRESENT. Ernst Luthy. *Fachhefte,* 1, January, 1955, pages 7-12 (6 pages) (in German). The first graining materials were quartz sand, pumice powder, glass sand and flintstone. The results were not satisfying so the Electro-Corundum was developed, a product of the arc furnace. Silicon carbide is still harder and more brittle so that until now it was known as the best graining material. The preparation of Electro-Corundum and silicon carbide is briefly described and the graining procedure given.

DRY OFFSET PLATES

A NEW CHEMICAL METHOD FOR ETCHING MAGNESIUM PRINTING PLATES. J. A. Easley. *TAGA PROCEEDINGS,* Sixth Annual Meeting, 1954, pages 76-79 (4 pages). After nearly five years of experimental work, a new method has been developed for chemically etching magnesium printing plates. Line engravings which require 60 minutes or more to be etched by conventional means can be etched to 0.020" depth is as little time as five minutes with this new method. The quality of etch is equal to or superior to most conventionally etched plates. Etching of the plate is accomplished by the application of a unique etching bath in a special etching machine. The bath contains nitric acid and certain organic film forming chemicals which give preferential protection to the sides of the image areas. In effect, the plate is continuously "powdered" during the etching operation, thereby eliminating the time consuming manual powdering operations. At present, this method of etching is recommended only for line work; however, promising results have been obtained

with halftones in the laboratory. It is hoped that this development, by providing an economical engraved printing plate, will help point the way to better and more economical methods of printing. Copies of the Proceedings may be obtained from the Secretary-Treasurer, George Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Mass., for five dollars.

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III. Paper and Ink

GENERAL

SCUFFING RESISTANCE DETERMINATIONS ON PRINTS. Deutsch Gesellschaft für Forschung im Graphischen Gewerbe. *Fogra Bull.*, No. 3, 1954, page 6 (in German). Two tightly stretched pieces of the print to be tested are rubbed against each other under a pressure corresponding to that of a delivery pile, one piece rubbing backwards and forwards and the other rotating. The action reproduces in a few minutes the effect of an hour's transport. The condtions, including temperature and humidity, under which the test is carried out are strictly standardized. A quality scale has been drawn up. *Printing Abstracts* 9, No. 8, August, 1954, page 560.

THE INK TRANSFER TO PAPER IN PRINTING. I. Olsson and L. Pihl. *Grafiska Forskningslaboratoriet* No. 35, November, 1954, pages 31-39, (9 pages) (in Swedish, abstract only in English). The influence of different variables in printing on the ink transfer to paper has been investigated at the Graphic Arts Research Laboratory, Sweden, during recent years. This paper summarizes the results of these studies. The effect of printing pressure, viscosity of the ink, printing speed and paper quality is shown. The effect of the roughness of the surface, the ink, the mechanical conditions in the printing press and other variables on the ink transfer is also discussed and shown experimentally.

*TESTING APPARATUS FOR THE PRINTER. *Deutscher Drucker* 52, No. 12, December, 1954, pages 593-595 (in German); *Printing Abstracts* 10, No. 3, March, 1955, page 141. The two instruments described were designed by the Institut der Deutschen Gesellschaft für Forschung im Graphischen Gewerbe, Munich, and are manufactured by Firma Karl GmbH, Weinheim-Birkenau. The printability tester prints test strips which can be tested and examined for ink consumption, setoff, strike-through, drying time, etc. Solid and screened testing blocks are provided, printing speed and impression are adjustable and the instrument can be adapted for testing rubber plates and blankets and stocks other than paper. The scuff resistance tester uses two test pieces, one mounted on a flat reciprocating plate and the other on a revolving cylinder. These two movements can take place simultaneously or separately. Deutscher Drucker is published by Verlag Ernst Boehme, Reichensteiner Weg 8-10, Berlin-Lichterfelde-West, Germany.

METALLIC INKS. *American Ink Maker* 32, No. 12, December, 1954, page 65; *Printing Abstracts* 10, No. 3, March, 1955, pages 119-120. Owing to the porous nature of Kromekote two impressions are required when printing with offset metallic inks. Use of two-color presses for this was not recommended. Other subjects discussed were: The effect of boiling on silver metallic inks, quick-set metallic

inks, the use of Panapol hydrocarbons to improve metallic ink brilliancy, metallic inks for aniline and gravure printing, the possibility of making chromium metallic pigments and the number of sheets which can normally be run without press shutdowns with a litho gold ink when fine detail work is involved.

PAPER AS A SUBJECT OF PRINTING RESEARCH. G. A. Svedlin. *Meddelanden från Industrins Centrallaboratorium* No. 138, 1955 (six pages) (in Finnish). A brief outline is given of proofprinting procedures so far developed to provide a numerical evaluation of the interaction between paper and ink. This interaction takes place at the impression moment when ink is transferred from the form to the paper. After the impression moment there is still an interaction between paper and ink when the ink vehicle penetrates into the capillaries of the paper and when the ink dries. While the ultimate printing result is affected by a variety of different properties of the paper, there is one group of interdependent paper properties namely, smoothness, softness and absorptiveness, which are particularly important to the interaction between paper and ink. It is claimed that printability research may enable the paper maker to balance these highly interdependent properties correctly in printing papers.

* THE MUTUAL REACTION OF PAPER AND PRINTING INK. W. Fühler. *Papier*, Darmstadt 9, No. 3/4, February 5, 1955, pages 60-1 (in German); *Printing Abstracts* 10, No. 4, April, 1955, page 192. The effect of the following factors on the drying of printing inks is briefly discussed: absorbency of paper, degree of sizing, picking resistance of paper, moisture content of paper, pH of paper, and the structure of the paper surface. Papier is published by Eduard Roether Verlag, (16) Darmstadt, Liebigstr., 24, Germany.

PAPER: GENERAL

* THE QUALITY OF PAPER AND BOARD IN RELATION TO ITS USAGE—PRINTING. H. H. T. Alway. *World's Paper Trade Review* 141, No. 23, June 10, 1954, pages 1842, 1844, 1846, 1848 and 1850; *Bulletin of the Institute of Paper Chemistry* 24, No. 12, August, 1954, page 1000. The present position is examined of the possibilities of assessing the printing quality of papers and boards as a result of instrumentation studies of the individual properties. The development of a precision proof press as a confirmation of printing quality and as an alternative method of evaluation is described, the emphasis being on the effect of paper and board on the color, the drying, the gloss, and the halftone fidelity of the finished print. Although a few of the fundamental background problems relating to the assessment of paper quality by instrumentation studies alone have been solved and others brought into clearer focus, much still remains to be done before the proof press can be regarded as a purely confirmatory check rather than a necessary auxiliary method of testing. 11 references. World's Paper Trade Review is published by Stonhill and Gillis, Ltd., 329, High Holborn, London, W. C. 1, England.

OFFSET PAPER CONDITIONING. C. W. Latham. *American Printer* 135, No. 5, May, 1954, pages 32-33 and 54, 54A. The necessity for conditioning paper, types of conditioning machines, the best way to use them, and variables to be taken into consideration when calculating conditioning time are discussed. *Printing Abstracts* 9, No. 8, August, 1954, page 565.

* YELLOWING OF PAPER BY PRINTING INKS. G. L. Erikson. *Inter-Society Color Council News Letter* No. 109, November, 1953, pages 3-4;

No. 110, January, 1954, page 8. Reference is made to a serious problem of color change of paper under the influence of printing inks and change of over-all color, particularly with greens, purples, and blues. The change is not so apparent with yellows, oranges, and reds. Examples of sample books printed about 20 years ago and in 1953 with the same ink on the same grade of paper substantiate the findings. The grade of paper used was found to be one of the best for holding color; others show even greater color changes. The author's remarks serve to illustrate that prints on paper are not a good way of preserving color samples; the method of putting these colors in opaque form on plastics seems to be much better. In the second part of the reference, comments by R. B. Hobbs of the National Bureau of Standards and H. S. Busby are given. *Bulletin of the Institute of Paper Chemistry* 24, No. 8, April, 1954, pages 665-666. The Inter-Society Color Council News Letter is published by the ISCC, P.O. Box 155, Benjamin Franklin Station, Washington 4, D. C.

* PRINTING PAPER REQUIREMENTS VIEWED IN THE LIGHT OF RECENT INVESTIGATIONS. Gösta E. Carlsson. *Allgem. Papier-Rundschau* 1954, pages 625-627, 670-674 and 714-715. The printing properties of various papers (including art paper, calendered glassine, halftone super-calendered printing paper, and newsprint) are reviewed. The transfer of ink to paper (termed the "transference no.") as a function of amount of ink retained by the roll, of the viscosity of the ink, of speed of printing, and of the compressive stress during printing, are discussed with suitable graphs. Tests for ink and oil absorption are outlined (especially in the case of papers sized with rosin, starch, or carboxymethylcellulose), as are resistance to picking, dimensional stability, and opacity of printing paper. The significance of research in the graphic-arts field is outlined. *Chemical Abstracts* 48, No. 19, October 10, 1954, Column 11786. Allgemeine Papier-Rundschau is published at Frankfurt a. Main 4, Fürstenbergerstr. 175, Germany.

* PAPER FOR OFFSET. A. W. Beecroft. *Paper Mill News* 77, No. 27, July 3, 1954, pages 136-137 and 139; *Paper Trade Journal* 138, No. 26, June 25, 1954, pages 66 and 69-70. The necessary qualities in paper for offset printing are discussed from the point of view of flatness and squareness of edge, picking strength, pH, ink receptivity, finishing operations (including die-cutting, embossing, folding, bronzing and varnishing), end use, and uniformity. The value to the printer of a paper testing department in the works is indicated. *Printing Abstracts* 9, No. 9, September, 1954, page 629. Paper Mill News is published by L. D. Post, Inc., 1309 Noble Street, Philadelphia 23, Penna.

GLASS FIBER PAPERS. R. B. Hobbs. *TAGA Proceedings*, Sixth Annual Technical Meeting, 1954, pages 104-110 (7 pages). Some of the problems encountered in the development by the National Bureau of Standards of a paper made entirely of glass fibers are discussed, and the present process of making such paper on a Fourdrinier paper machine is described. Characteristic physical and other properties of the paper are mentioned, and its present commercial uses are listed. The possible use of glass fiber paper for printing, writing, and records is considered. Its advantages and disadvantages for such use are discussed, and the kind of research that would need to be done is indicated. TAGA Proccedings may be purchased for five dollars each from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P. O. Box 513, Boston, Massachusetts.

THE EXCHANGE OF WATER BETWEEN PAPER FIBERS AND AIR. R. Cornely. *Der Polygraph* 6, No. 11, June 5, 1953, Fachzeitschrift 2 (1 page) (in German). The exchange of water between paper fibers and air is discussed. Following curves are presented: (1) %RH air vs. $\%H_2O$ in fibers, (2) Days vs. $\%H_2O$ in fibers for water absorption at 100% RH, (3) Absorption-drying curves, $\%H_2O$ vs. min. between 70 and 50% RH. Also, moisture content for seven fibers are given for 50 and 65% RH.

SURFACE SIZING OF BOARD WITH CARBOXYMETHYLCELLULOSE (CMC). I. Olsson and L. Pihl. *Grafiska Forskningslaboratoriet* 35, November, 1954, pages 16-20 (5 pages) (in Swedish). An investigation shows the influence of the amount of carboxymethylcellulose and its viscosity on the oil absorption of board. The board is surface-sized with water solutions of different concentrations and two kinds of cellulose gum are used. The influence of the gum depends on the viscosity and the amount of the gum. A low oil penetration is obtained by a 3-4% solution of a high viscosity gum.

PAPER FROM NYLON. *Printing Monthly* 6, No. 12, March, 1955, page 6. Paper produced from nylon has several interesting properties. It is three to ten times as strong as paper made from rags or conventional pulp. Also, it is highly resistant to chemical attack, absorbs very little moisture, resists action of molds, bacteria, and light. Resistance to folding was up to 200 times better than regular rag or wood pulp paper. Suggested uses include heavy-duty bags, filtration and packaging of corrosive chemicals, maps, tracings, and documents.

BEAT THE HUMIDITY WITH CANVAS COVERS. P. R. Russell. *American Printer and Lithographer,* 136, No. 5, May, 1955, page 28. This article describes how a publishing house covers piles of paper, both printed and unprinted, with canvas covers to prevent register troubles due to moisture changes. These covers are put over the stock and are fitted tightly around the bottom with a draw cord. These covers were found to be the best auxiliary aid to the plant's humidity control.

PAPER CONDITIONING. *TAPPI* 38, No. 1, January, 1955, page 91A; *Printing Abstracts* 10, No. 4, April, 1955, page 191. A temperature conditioning chart for paper, prepared by the Lithographic Technical Foundation, is reproduced.

PAPER: COATING

* MACHINE COATED PAPERS. F. J. M. Wijnekus. *Allgem. Papier-Rundschau* 1954, pages 1040-42; *Chemical Abstracts* 49, No. 3, February 10, 1955, Col. 2069. Difficulties encountered in offset printing are reviewed. A method is discussed that is used in determining the lowering of surface tension of H_2O that has been brought into contact with machine-coated papers containing surface-active agents. These permit a more satisfactory moistening of the paper that is to be printed. The apparatus consists of a torsion balance, indicating in mg. the weight required to detach the edge of a thin glass platelet from the surface of H_2O (or aqueous solutions), and the results are given in dynes/cm. Various machine-coated papers were examined and marked differences in surface-tension lowering were noted and tabulated. Allgemeine Papier-Rundschau is published at Fürstenbergstrasse 175, Frankfurt a. M. 4, Germany.

THE TECHNOLOGY OF PAPER COATING. I. *Paint, Oil and Chemical Review* 118, No. 7, April 7, 1955, pages 12-16, 52-54 (8 pages). Part I of four-part article which runs as follows: I.

Introduction; II. What Will Coatings Do for Paper? A. Moisture Vapor Resistance, B. Water Resistance, C. Grease Resistance, D. Alkali Resistance, E. Acid Resistance, F. Solvent and Chemical Resistance, G. Abrasion Resistance, H. Gas Resistance, I. Heat Sealing; III. Methods of Applying Coatings to Paper. A. Physical Form of the Coating, B. Machines for Coating Paper - 1. Sheet Coating, 2. Web Coating, 3. Print Roll Coating, C. Drying Systems.

THE TECHNOLOGY OF PAPER COATING. II. *Paint, Oil and Chemical Review* 118, No. 8, April 21, 1955, pages 16-18, 20-21, 38-39 (7 pages). The subject material covered in this article includes: IV. Inorganic Coatings for Paper - A. Coating Pigments, B. Coating Adhesives; V. Organic Coatings for Paper - A. Waxes, B. Water Soluble Organic Coatings - 1. Polyvinyl Alcohol, 2. Methyl Cellulose, 3. Sodium Carboxymethylcellulose, 4. Sodium Alginate.

THE TECHNOLOGY OF PAPER COATING. III. *Paint, Oil and Chemical Review* 118, No. 9, May 5, 1955, pages 22, 24-26, 34, 36-38 (8 pages). The index to Part III reads as follows: V. Organic Coatings for Paper - continued - C. Spirit Varnish Coatings, 1. Natural Resins, 2. Zein, D. Nitrocellulose Coatings, E. Cellulose Acetate and Related Esters, F. Cellulose Ether, G. Polyvinyl Acetate and Polyvinyl Chloride, 1. Polyvinyl Acetate, 2. Polyvinyl Chloride and 3. Polyvinyl Acetate - Polyvinyl Chloride Copolymers.

COATED OFFSET PAPER; PRINTING COATED OFFSET PAPER. Robert F. Reed. *American Pressman* 65, No. 2, January, 1955, pages 25-27 (3 pages); No. 3, February, 1955, pages 35-37 (3 pages); *Bulletin of the Institute of Paper Chemistry* 25, No. 9, May, 1955, page 744. In a series of articles on the correct procedures for lithographing coated offset paper, the first two parts cover an analysis of coated offset paper, including a definition, types (coated two side or enamel, coated one side, and machine coated), differences in printing coated and uncoated offset papers, advantages and disadvantages of the coated paper, and methods of handling the paper in the pressroom to obtain the best results. 16 figures.

PAPER: PROPERTIES

THE INFLUENCE OF CHEMICAL RESIDUES IN PAPER ON PRINTABILITY. R. R. Coupe. *The International Bulletin for the Printing and Allied Trades* No. 67, January, 1954, pages 42-47. A review of the effect of chemical residues in paper on the discoloration of inks, the tarnishing of bronze printing, the unsatisfactory drying of inks and the sensitization of lithographic plates.

AN INVESTIGATION OF METHODS FOR DIMENSIONALLY STABILIZING PAPER. F. W. Lorey and C. E. Libby. *TAPPI* 37, No. 8, August, 1954, pages 321-331 (11 pages). It was found that basis weight had no effect on the expansion of handsheets with increases in humidity nor did fiber size, except when the fibers were very coarse and greater expansion occurred. Freeness also had no effect except at high freenesses where the pulp was bulky and expansion greater, but sheets subjected to high pressures showed less expansion. The application of heat to wet handsheets decreased the expansion of the dried sheets with increases in humidity, but beater addition of a clay filler had no effect. Dimensional changes of sheets formed from sulphite pulp increased as the purity of the pulp increased, and sheets made from hardwood pulps expanded to the same extent as sheets made from softwood pulps. Silicone and rosin sizes, added by beater addition, did not de-

crease the dimensional changes of handsheets with changes in humidity. Neoprene-treated handsheets showed decreases in expansion with increases in humidity as the addition of neoprene was increased above 20%. When thermosetting resins were applied by impregnation, the handsheets showed less expansion with increases in humidity, and of the resins investigated, phenol-formaldehyde, thiourea-formaldehyde, and glyoxal-cellosize exhibited optimum effects in the order listed. Urea, a plasticizing agent, showed a negative effect and increased the dimensional changes with changes in humidity.

* A STUDY OF SHRINKAGE AND EXPANSION. E. J. Pritchard. *Proceedings of the Technical Section, British Paper and Board Makers' Association* 35, No. 1, February, 1954, pages 31-38. A basic relationship is shown to exist between the shrinkage and water expansion of paper, taking the form of a straightline graph. The slope of the line is an inherent quality of the pulp used; it varies from pulp to pulp. A theory of the mechanisms of shrinkage and water expansion is given. When a sheet of paper is formed, it consists of a mat of fibers swollen with water which also fills the interstices between the fibers. As the sheet is dried in air it shrinks; this shrinkage is brought about by the contraction of the cellulose fibers themselves and the contraction of the entire mass resulting from the surface-tension forces set up between the fibers. These compacting forces operate until further contraction is resisted by the strength of the structure. When the dried sheet of paper is immersed in water it expands, the expansion being caused by the swelling of the cellulose fibers taking up water by imbibition. There is no converse to the action of the surface-tension forces. When the sheet is immersed, the water will fill up the interstices between the fibers, but will have no force to push them apart. Once a bond has been formed by drying, it will not be broken again by immersion in water. It seems to follow that the reversible portion of the shrinkage and the water expansions are due solely to the contraction and swelling of the individual fibers of beaten and unbeaten pulp, whereas the irreversible portion of the shrinkage is due to the contraction of the mat by the surface-tension forces between the fibers. 9 diagrams and 2 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 11, July, 1954, page 902. The Proceedings are published by the British Paper and Board Makers' Association, Inc., St. Winifred's, Welcomes Road, Kenley, Surrey, England.

* STUDIES ON THE SUITABILITY OF PAPERS TO BE USED IN PRINTING. J. F. Monroy. *Assoc. tech. ind. papetière, Bull.* No. 3, 1954, pages 75-83 (in French). The author discusses the penetration of liquids into papers and the printability of paper, including such problems as dusting, picking, and offsetting, the surface structure of paper, and the reproducibility of the halftones. Instruments developed at the Instituut voor Grafische Techniek, Amsterdam and used in these tests (a dusting tester and the I. G. T. printability tester) are described and illustrated. 18 figures and 11 references. *Bulletin of the Institute of Paper Chemistry* 24, No. 11, July, 1954, pages 910-911. The Bulletin is published by the Association Technique de l'Industrie Papetière, 154 Boulevard Haussmann, Paris (8e), France.

RATING PAPER QUALITIES. C. V. Morris. *Printing Magazine* 78, No. 11, November, 1954, pages 68-69 (2 pages). The article describes how one buyer in a printing plant has classified every grade of offset made. Qualities such as whiteness, brightness, finish, opacity, dimensional sta-

bility, caliper thickness, likesidedness, foldability, stiffness and filler content are recorded. Many of the properties are graded by simple, physical observation.

PAPER MOISTURE BALANCE IN LITHOGRAPHY. G. W. Hammer and W. P. Greenwood. *TAGA Proceedings*, Sixth Annual Technical Meeting, 1954, pages 207-222, (16 pages). Some of the requirements for lithographing sheets in controlled atmospheric conditions are considered. A proposed type of chart for decisions on paper conditioning is described. Current conditions and practices in a number of plants have been reported in questionnaire form. A summary of this data is given on: type of air conditioning, temperature and R.H. standards, paper conditioning matters such as per cent conditioned, atmospheric balance, rough volume of color register work, use of the paper hygroscope. This work is intended to supplement published material with current operating conditions and problems, with a view toward avenues of improvement. TAGA Proceedings may be purchased for five dollars from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Company, P.O. Box 513, Boston, Massachusetts.

PRINTABILITY REQUIREMENTS FOR UNCOATED PAPER STOCKS. A. Glassman. *Pulp and Paper Magazine of Canada* 56, No. 3, Convention issue, 1955, pages 245-251 (7 pages) (Not to be reproduced without permission). Paper requirements by the modern printer for high speed printing of magazine, catalogue and label work include a high degree of runnability and impression tolerance, and a proper degree of uniformity of absorption as well as the usual need for consistency of basic weight and caliper across the web and from roll to roll, control of smoothness, gloss, color, etc. Examples of how poor runnability, lack of sufficient impression tolerance, over-absorption, under-absorption, and non-uniform absorption affect quality in high-speed printing are given.

THE EFFECT OF MOISTURE ON PAPER. H. Mack. *Polygraph* 8, No. 1, January 5, 1955, pages 6-7 (2 pages) (in German). The moisture content of paper in relation to air RH is discussed. Some absorption-disorption curves are given and moisture contents for typical fibers and papers.

PAPER FOR OFFSET. Part 1. *Modern Lithography* 23, No. 4, April, 1955, pages 42-43 (2 pages). This first part discusses the compromises involved with and the relationship existing between properties such as tensile strength, tear and curl resistance, water resistance, opacity and others.

*AIR PERMEABILITY AND PRINTABILITY. R. R. Coupe. *Paper Market*, February, 1955, pages 53-54, 56; *Bulletin of the Institute of Paper Chemistry* 25, No. 9, May, 1955, pages 741-2. The author shows by different examples that, although air-permeability measurements may sometimes correlate with printing requirements, they are an inadequate guide to the influence of paper on ink transfer and penetration. 4 tables and 8 references. Paper Market is published at Graham House, 3 Tudor Street, London E. C. 4, England.

THE PRINTING QUALITIES REQUIRED OF COATED PAPERS. A. Lewenstein. *TAPPI* 38, No. 4, April, 1955, pages 150-151A (2 pages); *Bulletin of the Institute of Paper Chemistry* 25, No. 9, May, 1955, page 729. The author discusses some of the printing requirements of conversion-coated paper (I) (strength, uniform absorptivity of the correct degree, dimensional stability, noncurling tendencies, etc.) and explains why the final (I) is a compromise between conflicting needs and desires.

PAPER FOR OFFSET. Part 2. *Modern Lithography* 23, No. 5, May, 1955, pages 46-47 (2 pages). The properties of paper such as pick resistance, water sensitivity and dimensional stability are discussed. Printing is discussed as being the real test of a paper's performance.

PAPER: TROUBLES

FLUFFING OF LITHO PAPER. R. I. Jackden. *Modern Lithographer and Offset Printer* 50, No. 4, April, 1954, page 24. This defect differs from "picking" in that individual fibers are lifted from an uncoated sheet by the suction of tacky litho inks. It usually occurs on the under or wire side of the sheet, and among preventive measures is high calendering of the paper stock in order to roll the partly loose fibers into the surface of the material. *Marathon Graphic Arts Abstracts* 1, No. 6, June, 1954, page 79.

* WAVINESS AND COCKLING IN PAPER. *Paper-Maker (London)* 127, No. 6, June, 1954, page 453; *Bulletin of the Institute of Paper Chemistry* 24, No. 12, August, 1954, pages 991-2. The effects of insufficient or excessive moisture in paper and means for correct maturing and conditioning prior to printing are outlined. Paper in a single sheet will adjust itself rapidly to the atmospheric conditions of its surroundings; however, when stacked in reams under the considerable pressure of its own weight, troubles are likely to develop. Paper-Maker is published by S. C. Phillips and Co., Graham House, 3, Tudor Street, London, E. C. 4, England.

* THE DUSTING OF PAPER. *Österr. Papier-Ztg.* 60, 7, 1954, page 15 (in German); *Tech. Bull. Tech. Sect. Brit. Pap. Bd Mkrs' Ass.* 31, 6, December, 1954, pages 184-185; *Printing Abstracts* 10, No. 3, March, 1955, page 125. Dusting occurs principally with printings which are heavily loaded and particularly with machine-finished papers. Addition of a small amount of boiled starch to the beater pulp helps to hold the filler particles better in the paper structure. Similarly, sizing also mitigates fluffing. A highly glazed machine-finished paper or a supercalendered paper (the latter being appreciably moistened in calendering) has the filler compressed into the inner part of the sheet and the surface is therefore not so liable to dust. This applies especially to the more bulky papers. The character of the stock fibers also plays a part — thus, pulp well de-lignified and consequently suppler (perhaps refined) has good filtering properties and retains even the smallest particles. The recent curlated pulps can help in this way, too. It is advisable not to include too large a proportion of saveall material in the stock, since oversaturation with filler and fibre fines will promote dusting in the finished paper, unless this is body stock for subsequent coating. Machine-coating, however light, helps to counteract fluffing. Overdrying of paper occurs perhaps less nowadays, though over-heated cylinders, especially early in the dryer section, can bring about plucking which pits the surface of the sheet and raises on the paper a nap of fibres and fibrils apt to fluff and which can scarcely be remedied. Österr.Papier-Zeitung is published by Papier-und-Buchgewerblicher Verlag, Rennweg 64, Vienna 3, Austria.

PAPER: TESTING

HOW TO USE THE LTF PICK TESTER. *American Pressman* 64, No. 7, June, 1954, pages 22-25. Directions are given for using the LTF pick tester, a machine developed by the Lithographic Technical Foundation to test the pick resistance of offset papers. The necessary materials are listed, and steps of setting up the instrument, applying the blanket, preparing for the test, making the test, and determining the test results are

outlined. Standard temperature and R.H. conditions are established; the need for proper clean-up procedures is emphasized. The pick tester can be used for letterpress paper, but tests have not been evaluated to guarantee their reliability. 9 illustrations. *Bulletin of the Institute of Paper Chemistry* 24, No. 11, July, 1954, page 910.

NEW METHODS FOR OBSERVING PROPERTIES OF PAPER WHICH INFLUENCE PRINTABILITY. H. H. Hull and M. C. Rogers. *International Bulletin for the Printing and Allied Trades* No. 68, April, 1954, pages 12-13 and 21-23. New methods of paper testing for printability are described which are modifications of drawdown techniques familiar to printing-ink manufacturers. These tests are rapid, not complicated, and suitable for control work; they demonstrate the complexity of the paper surface and explain that one test alone cannot be expected to characterize the printability of a paper and that small-area samplings of paper may lead to erroneous conclusions. The following methods (primarily developed by comparing coated papers) are covered: the rigid-blade drawdown which indicates paper formation and caliper variation; the flexible-blade drawdown which characterizes the coating surface; and wipe tests which are essentially absorption measurements giving an indication of the fine character of the coating surface. The individual tests are described in detail, and their significance and interpretation are discussed. The authors claim that the classification of paper-surface contour by drawdown techniques offers printers and papermakers a means for estimating printability in agreement with pressroom performance. 1 table, 7 figures, and 4 references.

* PAPER TESTING. Ernest Schmatolla and Charles V. Morris. *Productionwise,* 3, June, 1954, pages 20 and 22; *Marathon Graphic Arts Abstracts* 1, No. 8, August, 1954, page 110. Taking a cue from papermakers, the authors recommend that printing papers be tested with ultraviolet (black) light to identify surface characteristics of a sheet or roll. The method reveals the comparative opacity of different papers and permits selection of a brand or kind from stray samples, besides showing varying surface characteristics (departures from uniformity) and distinguishing one side of a sheet or roll from the reverse side. Testing is based on the fact that under ultraviolet light, different papers appear in varying shades of violet, the actual hue depending on the materials and method used for manufacturing the stock, and which affects its surface characteristics. Productionwise is published by Colton Press, Inc., 468 Fourth Avenue, New York 16, New York.

A COMPENSATION CHART FOR THE EFFECTS OF AMBIENT CONDITIONS ON PAPER HYGROSCOPE READINGS. G. C. Wheeler and R. F. Reed. *TAGA Proceedings,* Sixth Annual Meeting, 1954, pages 80-84 (5 pages). The errors in the measurement of paper humidity by means of gold beaters skin hygrometers are described. They are caused by the moisture capacity of the sensing element and temperature effects. They were measured for the LTF Paper Hygroscope and corrections for them given by means of an alignment chart. TAGA Proceedings may be obtained from the Secretary-Treasurer, George Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Massachusetts, for five dollars each.

EXTENDING THE RANGE OF THE NBS STIFFNESS TESTER. Vernon Worthington. *TAPPI* 37, No. 9, September, 1954, pages 384-7 (4 pages); *Bulletin of the Institute of Paper Chemistry* 25, No. 2, October, 1954, page 135. Two instruments suit-

able for measuring the stiffness of paper and a novel specimen cutter are described. One stiffness tester provides for two testing ranges, and is suitable for heavy papers and light cards. The second stiffness tester is suitable for very weak materials such as tissues. Certain new features have been incorporated in these models, but the basic principle remains the same as that described in the previous construction. Some difficulties encountered in testing very weak materials are discussed, and certain test procedures are suggested. 1 table, 5 figures, and 1 reference.

*LABORATORY INVESTIGATIONS CONCERNING THE SUITABILITY OF SEVERAL INSTRUMENTS FOR THE RAPID MEASUREMENT OF THE MOISTURE CONTENT OF PAPER. Walter Brecht and Ludwig Körner. *Das Papier* 8, Nos. 13/14, July, 1954, pages 247-258; Nos. 19/20, October, 1954, pages 419-430 (in German, English and French summaries). The operating principles and construction data of four moisture testers for paper are described in detail in a study which is based on a doctoral dissertation of Darmstadt. Three of the instruments measure the electric resistance (Textometer of Mahlo-Saal, the moisture meter of Mundinger, Renningen, and the Hart moisture meter, New York); the fourth of them, the Hygrotester built by Paul Lippke, Neuwied measures the dielectric constant. In all cases single test sheets were used in place of the running paper web; all measurements were checked against data obtained by the standard method with balance and drying oven. When extreme care is taken to avoid moisture changes in the samples during handling (i.e., between sample taking and first and second weighing), the accuracy of the standard method was found to be + 0.2%. The present results obtained with the four instruments indicate that all of them are suitable for the intended purpose and, provided special precautions are taken in each case, will give satisfactory values. The accuracy of all instruments (for samples which differ in moisture content only) is about the same, i.e., + 0.3-0.4%. Whereas 10 parallel moisture determinations with the standard method require several hours, the instruments will give results within one to three minutes. However, consideration must be given to the fact that all instrument data are also influenced by other paper properties. The results of the electrical-resistance instruments will vary with furnish, fillers, and electrolyte content of the papers, whereas amount of lignin present, type of furnish, beating degree, density of sheet, and amount of filler will exert an influence during the dielectric measurements. The deviations in the latter case are somewhat less than in the former; however, satisfactory results can be obtained with either method only when the decisive characteristics of the paper to be tested are known and appropriate calibrations are applied. 3 tables, 38 figures, and 37 footnotes. *Bulletin of the Institute of Paper Chemistry* 25, No. 3, November, 1954, pages 216-217. Das Papier is published by Eduard Roether Verlag, Liebigstrasse 24, Darmstadt, Germany.

SOME PRACTICAL PAPER QUALITY TESTS PRESSMEN CAN MAKE WITH ULTRA VIOLET LAMP. C. V. Morris. *American Pressman* 65, No. 2, January, 1955, pages 6, 8, 10 and 14 (4 pages). Suggest the use of ultraviolet light to distinguish between different makes, weights and qualities of coated and enamel papers. Also, to distinguish between the felt and wire sides of uncoated papers.

DETERMINING THE RIGIDITY, STIFFNESS AND SOFTNESS OF PAPER. James d'A. Clark. Reprint from *Paper Trade Journal* (4 pages) available from Thwing-Albert Instru-

ment Company, Penn Street at Pulaski Avenue, Philadelphia 44, Penna. Various methods for determining the stiffness or flexibility of paper and paper board are reviewed briefly and a new simple method is presented for determining the rigidity-flexural resistance; rigidity factor-proportional to the modulus of rigidity; stiffness-inverse of flabbiness, and the softness-feeling when crumpled. The tests can be made simply with a threefold pocket rule and consist essentially of determining the overhang of a strip which, when the clamped end is rotated through a right angle, will just fall over in the direction turned, and applying a given formula. Results can be reproduced to within 5 per cent.

EXPANSION TESTER FOR PAPER. A. Arnamo. *Grafiska Forskningslaboratoriet* No. 35, November, 1954, pages 6-9 (4 pages) (in Swedish, abstract only in English). A new expansion tester for paper developed by the Graphic Arts Research Laboratory is described. In the instrument eight strips of paper can be tested simultaneously. The expansion and contraction are indicated by means of a sensitive electrical system in the bottom of the instrument and the changes of length can be read directly in percent on micrometers. The instrument has proved to be accurate and easy to handle.

TESTING THE PRINTABILITY OF NEWSPRINT. B. Dahlström, I. Olsson and L. Pihl. *Grafiska Forskningslaboratoriet* 35, November, 1954, pages 21-30 (10 pages) (in Swedish). The physical properties of different kinds of newsprint have been measured as smoothness, porosity, oil flotation number, basis weight, opacity, etc. At the same time different factors connected with the print have been determined as ink transfer number, blackness, print-through, etc. The quality of the prints has been judged by several persons, and through calculation of the correlation coefficients the existing relationships between the quality of the print and the properties of the paper have been investigated and discussed. Among the properties investigated only the porosity, the ink receptivity and the opacity of the paper seem to influence the printing result.

THE CHAPMAN PRINTING SMOOTHNESS TESTER. I. BASIC DEVELOPMENT AND REPORT MODIFICATIONS. S. M. Chapman. *TAPPI* 38, No. 2, February, 1955, pages 90-96 (7 pages). Printing smoothness is defined as the fraction of the surface which can be brought into contact with a smooth surface pressed against it under pressures comparable to printing pressures. An instrument designed to measure this property by an optical method was disclosed in a previous report from the Pulp and Paper Research Institute of Canada. The present paper reviews the theory of the method and discusses its theoretical shortcomings. One of these is the fact that the paper surface must make optical contact with a glass surface in order to register as contact. In printing, on the other hand, the paper surface need only approach the printing form to within the thickness of the ink film.

DEVELOPMENT AND USE OF THE LTF PICK TESTER. G. C. Wheeler. *TAPPI* 38, No. 2, February, 1955, pages 132-134A (3 pages); *Bulletin of the Institute of Paper Chemistry* 25, No. 7, March, 1955, page 556. The author reviews previously published concepts, shows the correlation of LTF pick tester results to industrial experience, and discusses current work with a strain-gage technique to measure forces developed during the impression. 2 tables and 5 figures.

*LABORATORY INSTRUMENT FOR REFINED SMOOTHNESS TESTS. *Paper Trade Journal* 138, No.

36, September 3, 1954, page 40; *Printing Abstracts* 9, No. 12, December, 1954, page 813. The RD Smoothness Tester, for determining the smoothness of both the felt and wire sides of the paper, separately and simultaneously, is available from W. & L. E. Gurley, Industrial Division, Troy, New York. The test consists of comparing the paper sample against optically flat metal surfaces, by determining the rate at which air flows between the two. The sample is placed between two circular steel blocks and held by the top one only. It is tested in a practically uncompressed condition. The instrument is available in two models: (1) with small test blocks of one square inch contact area and used for newsprint, kraft, bond, and other low-finish papers; (2) with large test blocks, used for smoother papers. Paper Trade Journal is published by Lockwood Trade Journal Co. Inc., 15 West 47th Street, New York 36, New York.

* A MOLECULAR APPROACH TO THE PROBLEM OF VISCOELASTICITY. A. H. Nissan. *Nature* 175, No. 4453, March 5, 1955, page 424; *Bulletin of the Institute of Paper Chemistry* 25, No. 8, April, 1955, page 638. The author proposes a theory whereby the stress in paper may be expressed as a power series function of a strain. Hypothesizing that the strain energy causes an increase in the hydrogen-bond potential, he is able to evaluate the coefficients of the power series spectroscopically. The coefficients so derived are in reasonable agreement with those found from rheological data. A more detailed treatment of the theory will be published elsewhere. One diagram and one reference. Nature is published by Macmillan and Co., Ltd., St. Martin's Street, London, W. C. 2, England.

THE EFFECT OF SOME MACHINE CHARACTERISTICS ON PAPER UNIFORMITY. J. Mardon, G. Gavelin and K. C. Logan. *Pulp and Paper Magazine of Canada* 56, No. 3, Convention issue, 1955, pages 275-297 (23 pages); *Bulletin of the Institute of Paper Chemistry* 25, No. 8, April, 1955, pages 637-8. An objective evaluation of some machine characteristics which cause non-uniformity in paper is presented. Particular emphasis is placed on variations of basis weight, moisture, caliper, and the firmness of finished rolls, which are shown to be closely related. In the first part, the measurement of velocity and flow pattern in various parts of the headbox as determined by means of specially designed Pitot tubes is described. Similar measurements are also outlined for the jet efflux from the slice, and variations in the slice are correlated with design and operational features of the headbox and screens. In the second part, the effect of these flow variations is related to weight variations found with and across the grain of the finished paper as determined with the Betameter. These weight variations, which in turn affect the moisture and caliper, are studied in relation to paper-reel uniformity. A device for objectively evaluating this reel uniformity is described in the third part, and the experimental results are treated statistically to elucidate the relationships between weight, moisture, caliper, and reel hardness. Some operational features affecting reel hardness are isolated. 11 tables, 53 figures, and 20 references.

* PICK TESTER. *U.S. Patent 2,705,424*. A. W. Pomer (to John Waldron Corp). *Official Gazette* 693, No. 1, April 5, 1955, pages 34-35. 1. Apparatus for pick testing sheet material to be printed, which comprises means for subjecting successive areas of a sample of the material to substantially constant pressure printing with an ink of constant tack, means for maintaining the ink at substantially constant temperature, and means for

accelerating the speed of printing for each successive area to a final speed beyond that at which picking occurs, and at which the printing on the final area of the succession is unsatisfactory, whereby the speed of the area which shows evidence of pick is an index of the pick characteristic of the material.

* A MILL TRIAL OF MOISTURE METERS. British Paper and Board Industry Research Association. *World's Paper Trade Review* 143, No. 8, February 24, 1955, pages 618 and 620; *Bulletin of the Institute of Paper Chemistry* 25, No. 9, May, 1955, page 741. A brief reference is made to a nine-month comparative efficiency study of seven British and foreign instruments (Atrometer, Baldwin moisture meter, Elop Hydrotester, Fielden Drimeter, Marconi moisture meter, Lippke Hygrotester, and Verigraph) for determining the moisture of the sheet on a board machine. The instruments were installed and operated according to the manufacturers' instructions on a machine in a board mill and the results checked against those obtained by oven drying of samples. A statistical evaluation of the data is being made, the results of which will be available to members of the association. The trials may be extended to a paper machine later on. World's Paper Trade Review is published by Stonhill & Gillis Ltd., 329 High Holborn, London, W. C. 1, England.

* A NEW MOISTURE METER; PRINCIPLES OF THE ATROMETER METHOD. Robert P. Nuki. *World's Paper Trade Review* 143, No. 11, March 17, 1955, pages 900, 905-6; *Bulletin of the Institute of Paper Chemistry* 25, No. 9, May, 1955, page 741. A new instrument for measuring the moisture content of a running web, the Atrometer, is described, which is based on the measurement of the moisture content of the air immediately surrounding the paper, without requiring actual contact with the web. It consists principally of a feeler (an acid- and heat-resisting hygroscopic rod which rapidly changes its resistance to electric current as it absorbs more or less moisture from the air rising from the paper sheet) connected by an armored cable to an electronic amplifier and a cabinet containing an indicating and recording apparatus. The feeler element is about two feet long and housed in a perforated chromium-plated casing which permits the air current to flow freely around it. On narrow and medium machines one feeler is sufficient; a number of elements may be installed on wider machines. The location is of paramount importance; the best position is after the last drier before the paper reaches the winder. Usually the feeler is fitted in a fixed position, but it can also be installed in such a way that it can be moved manually across the width of the web. An accuracy of $\pm$ 0.5% of the instrument readings is claimed for paper and of $\pm$ 0.8% for board. 1 table and 2 figures. World's Paper Trade Review is published by Stonhill & Gillis Ltd., 329 High Holborn, London, W. C. 1, England.

COLOR MEASUREMENT AND WHITENESS. D. L. MacAdam. *TAPPI* 38, No. 2, February, 1955, pages 78-87 (10 pages); *Printing Abstracts* 10, No. 4, April, 1955, page 230. Measurement of whiteness, for undyed and dye-whitened paper, is discussed in terms of the general method of measuring color. Several proposed formulae for expressing whiteness are compared and discussed.

INK: GENERAL

LIGHTFASTNESS OF PRINTING INK PIGMENTS. T. E. Ludwig and S. R. Benson. *American Ink Maker* 32, No. 7, July, 1954, pages 28-33 (6 pages). The present investigation had

as its object the determination of the relative lightfastness of the various printing ink pigments, and represents a continuation of the studies reported in the American Ink Maker, February, 1953. The original work presented the lightfastness data obtained by Fade-Ometer exposures of a large group of pigments available to the printing ink industry. The present report covers the data obtained by sunlight exposures of the same pigments, and also includes the Fade-Ometer results reported for purposes of comparison.

MISTING PROBLEMS IN HIGH SPEED ROTARY PRINTING. Ira Williams. *American Pressman* 64, No. 11, October, 1954, pages 6, 8 and 12 (3 pages). Ink misting problems during high speed press operations are discussed. A mechanism by which the ink mist is formed is proposed. The proposed mechanism consists of four steps. 1. Combination of two ink films into one at the nip of the ink rolls. 2. Development of tension in the ink film on the separating side of the rollers' nip. 3. Cavitation of the film to form ink strings. 4. Formation of ink mist droplets when some strands rupture in more than one place. An apparatus for studying ink misting was developed. Steel ink rollers with variable surface speeds of 0 to 1500 feet per minute provide the working surface for the ink. Electrical conductivity of the ink at the nip of the rollers is measured and the mist produced is trapped and weighed. Facts learned thus far are: 1. normal ink films on single rolls remain intact even at high speeds; 2. ink film splitting must occur for misting to happen; 3. pigmentless ink vehicles also mist; 4. long vehicles mist more than short ones; 5. for a given ink a certain threshold speed must be surpassed before misting occurs; 6. electrical charges on the ink determine the amount of mist produced; and 7. elastic strain in the ink film is a factor in misting.

THE IMPACT OF SYNTHETIC RESIN VARNISHES ON LITHOGRAPHIC INKS. C. R. Conquergood. *Canadian Printer and Publisher* 63, No. 11, November, 1954, pages 41 and 92 (2 pages). The increasing role of synthetic resin varnishes in lithographic inks is summarized. Among advantages are listed 1) quicker-setting and drying, 2) higher gloss when desired, 3) harder drying films, 4) ready-to-use formulations, and 5) excellent press performance. The greatest disadvantage claimed is that blankets and rollers must be chosen that are compatible with the mineral oil that many synthetic varnishes contain.

THE BLEEDING OF INKS IN HIGH HUMIDITIES. H. H. Hull. *TAGA Proceedings,* Sixth Annual Technical Meeting, 1954, pages 151-155 (5 pages). Some pigments used in printing inks have a sufficiently high water solubility that they "bleed" when exposed to atmospheres of high humidity. Under these conditions, halftones printed with them will change color and when the printed picture is a color proof, it may be impossible for the printer to "match" it. A test has been developed which permits the estimation of the degree of "bleed" for any printing ink. It is made by printing a light halftone (5%) on the paper selected for the printed job, exposing this sheet to an atmosphere of 100% relative humidity at room temperature for 16 hours. Bleeding is indicated by a deepening of the color. The color change is measured by instrument. TAGA Proceedings may be purchased for five dollars each from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Massachusetts.

THE CONTROL OF PRINTING INKS. F. A. Weymouth. *American Ink Maker* 33, No. 1, January, 1955, pages 30-35 and 69 (7 pages). In a general and simplified manner the instruments and methods of control

that are available to an ink manufacturer for quality control of his product are described. These descriptions include Mullen dispersion tester, IPI plate wear machine, Inkometer, Weatherometer, and recording Spectrophotometer. Limitations of process inks are effects of heat, film thickness. Changing ink film thicknesses are discussed.

QUICK SET VARNISHES. W. Wright. *American Ink Maker* 33, No. 1, January, 1955, pages 29, 65 and 67 (3 pages). This article describes the basic differences between standard litho and quick-set varnishes. The mechanism of quick-set varnish drying and examples of formulation ingredients are given.

WHAT TO EXPECT FROM YOUR INKS. Earl Hickox. *National Lithographer* 62, No. 2, February, 1955, pages 75-77 (3 pages). Factors that are important to correct formulation and use of metal decorating inks are briefly discussed. Such things as number of prints, times and temperatures of bakes, sizing or coating to be printed over, and kind of a varnish finish should be considered. A brief discussion of such control instruments as the "Muller," weatherometer, and inkometer is given.

*PRINTING INKS FOR POLYETHYLENE SURFACES. *German Patent 898,906.* Badische Anilin and Soda Fabrik and R. Buchwald. *Brit. Plast. Fed. Abstr.* 9, No. 11, November, 1954, page 1127; *Printing Abstracts* 10, No. 2, February, 1955, page 60. Polyethylene is dissolved in benzene, toluene or decahydronaphthalene and a stabilizer such as linseed oil varnish, an alkyd resin or polyisobutylene is added. The fine dispersion of polyethylene so obtained is cooled, blended with a pigment and used for printing on polyethylene. German patents may be obtained as photoprints from the U.S. Patent Office, Washington 25, D. C.

TIN PRINTING INK. *Paint Technology* 19, No. 209, February, 1955, page 58 (complete article appears here). A stoving ink for tin-printing contains 76 p. benzyl ether of dimethylol urea, 24 p. benzyl alcohol, 32 p. melamine hydrochloride, 25 p. long-oil modified alkyd, and 100 p. Prussian blue. The "drier" for this medium consists of 60 p. phthalic anhydride, 18 p. tricresyl phosphate, 6 p. rosin, 4 p. Blanc Fixe, 12 p. of a 5:95 solution of aluminum stearate in liquid paraffin, and 2 p. 6% cobalt linoleate. The amount of drier required is determined by reference to a graph similar to the one already referred to but drawn specifically for these particular constituents of medium and drier and for the stoving temperature envisaged. The latter may be relatively low (e.g. at 80° C., with 10% of drier added to the medium, setting time is 35 min.), but increased resistance to water, etc., is obtained by stoving for up to an hour at 150° C.

*RHEOLOGICAL CONTROL APPARATUS. *U.S. Patent 2,707,916.* Daniel Smith and Daniel Hurley (to Interchemical Corp.). *Official Gazette* 694, No. 2, May 10, 1955, page 188. 2. The combination, with a printing press having a multi-roller distributing system, of apparatus for adjusting the rheological properties of printing ink therein, comprising means for detecting changes in the viscosity of printing ink on one of the rollers of the system, a nozzle directed toward another of the rollers in said system in advance of the first-named roller and connected with a supply of solvent for said printing ink, a valve connecting the supply solvent to said nozzle, and means automatically actuated by said detecting means for opening and closing said valve when the detected viscosity changes exceed predetermined amounts.

BRONZE INKS FOR OFFSET LITHO. *Der Polygraph* 8, No. 5, March 5, 1955, page 148 (in German). In order to eliminate the troublesome and unhealthy bronzing of printed matter, bronze and vehicle are combined and printed on paper as ink. This brought up the problem of finding a pigment and a vehicle that will meet the demands of offset. So far the results are not satisfactory. Glossy papers only can be printed: fine line pictures or drawings should not be reproduced, bronze inks can be varnished or lacquered over.

ULTRASONIC VISCOMETER. *American Printer* 135, No. 11, November, 1954, page 12. The Ultra-Viscoson manufactured by Cincinnati Division of Bendix Aviation Corporation is finding new uses such as control of color shade in gravure inks through viscosity control. A hermetically sealed viscosity sensing probe operating at ultrasonic frequencies can be mounted directly into the ink reservoir. The probe is connected to an electronic computer which translates the damping effects of liquids on the vibrating probe into viscosity units.

AN EXPERIMENTAL STUDY OF INK FILM THICKNESSES. D. N. Adams. *TAGA Proceedings*, Sixth Annual Technical Meeting, 1954, pages 194-206 (13 pages). This paper describes an experimental arrangement designed to measure the relative thicknesses of ink films existing on the ink storage drums of a Harris LTV Press under printing conditions. This experimental arrangement is based on the absorption of beta particles by the ink films. TAGA Proceedings may be purchased for five dollars each from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Massachusetts.

* THE MEASUREMENT OF VISCOSITY IN THE PRINTING INK INDUSTRY. A. Gower. *Chemistry and Industry*, 1954, No. 20, page 566; *Paint Technology* 19, No. 208, January, 1955, page 18 (summary presented in its entirety). A summary of a paper presented before the Edinburgh Section of the Society of Chemical Industry. The viscosity of printing ink is generally determined with a Couette or rotating cup and bob type viscometer, in which a small annular distance between the two cylinders reduces the region of non-laminar or "plug" flow at low rates of shear. The curve obtained from a series of torque readings at various rates of shear gives an indication of yield value, and a coefficient of plastic viscosity can be calculated from the slope of the straight part of the curve. The parallel-plate or "spreadometer" viscometer, developer by Voet, is a useful instrument that measures the rate of increase of the diameter of a known volume of ink subjected to a constant load between two parallel glass plates. For most inks the relation between drop diameter and logarithmic time is linear. A yield value can be calculated by leaving the ink to form an ultimate maximum diameter. The "Inkometer" measures the force required to rotate at given speeds two ink-covered rollers, and gives results that are accurate for the prediction of the behavior of ink on the press although they cannot be interpreted purely as plastic viscosity due to such factors as the viscoelastic nature of high-speed ink film separation, cavitation in the ink, and deformation of the rollers. Thixotrophy is probably measured by Bowles' "empirical flow test" using a rotational viscometer, the inner cylinder of which applies a slowly decreasing torque for a measured time to a previously broken down ink structure.

INK: DRYING

DRIERS, QUICK DRYING INKS OR ANTI-SET-OFF SPRAY? R. Rau. *Der Polygraph* 7, No. 7, April 5, 1954,

pages 275-6 (in German); *Printing Abstracts* 9, No. 7, July, 1954, page 484. The problem of ink drying, particularly with regard to packaging materials, is discussed. Recently developed highly concentrated inks which allow a thinner ink film to be printed are an improvement on earlier quick-drying types.

"ACID" PAPERS AND INK DRYING. R. R. Coupe. *Penrose Annual* 48, 1954, pages 113-115 and 1 plate. The author discusses the relationship between the acidity of papers and ink-drying troubles. Using the PATRA "Drying time on paper" apparatus, a series of otherwise identical papers was tested in which only the acidity was varied in the pH range of 7-4 by small additions of sulfuric acid to the pulp; a sharp increase in drying time was noted below a pH of 5 down to 4 (very acid papers). The first experiments were carried out at a R.H. of 65%, and little difference was found between the drying times on the various sulfite papers. When the experiments were repeated at 75% R.H., wide variations were found between the different papers, those of high acidity giving much higher drying times than the neutral ones. The drying times on all papers were higher at 75% than at 65% R.H., but the relative increase at the higher R.H. was much greater with the acid papers. The reason for this type of nondrying is considered to be an interference by the acid paper with the driers added to speed up oxidation drying. When the driers are adsorbed by the fibers, they do not seem to function as effectively in speeding up the oxidation as otherwise. It is known that papers of pH values below 5 are likely to cause ink-drying troubles. The papermaker should endeavor to produce paper with a pH value in the range of 4.8-5. If this ideal cannot be achieved, it is still essential that the pH should not fall below about 4.5, for below this figure drying troubles become very common, more so in lithography than in letterpress, because in the former there is always moisture present. 1 table and 2 figures. *Bulletin of the Institute of Paper Chemistry* 25, No. 1, September, 1954, pages 46-47.

THE INFLUENCE OF PAPER ON THE AUTOXIDATIVE DRYING OF PRINTING INKS. R. R. Coupe. *Journal of the Oil and Colour Chemists' Association* 37, No. 413, November, 1954, pages 621-637 (17 pages). The rate of drying of printing ink on paper falls as the acidity of the paper rises, the effect being more marked at higher ambient humidity. It is primarily due to the irreversible sorption of cobalt (probably as the ion) on the cellulose fibres. Troubles are more often experienced in lithography than in letterpress printing, owing to the larger amount of water, the smaller amount of cobalt, and the thinner films customary with the former process. Addition of cobalt nitrate to the ink or to the fountain solution may afford a remedy.

GRAFO DRIER, A NEW DRIER FOR OFFSET INKS. A. Arnamo and L. Pihl. *Grafiska Forskningslaboratoriet* No. 35, November, 1954, pages 12-13 (in Swedish, abstract only in English). A compound in this drier reacts with the emulsified fountain water and evolves oxygen within the ink film. The effect of the drier is not decreased by the emulsified water which often happens with other types of driers. The new drier requires, however, some emulsified water to be fully active. The drying of the ink film is not dependent on the oxygen in the surrounding atmosphere to the same extent as when using other driers. A print in the middle of a pile will dry almost as quickly as a print on top of the pile. A special quality of the drier called Grafo Drier Extra, gives high rub resistance to the print.

VARNISH AND GUM ON PAPER DRIED IN FIVE SECONDS BY INFRA-RED HEATING. *Modern Lithographer and Offset Printer* 50, No. 12, December, 1954, page 25. Label sheets and book covers are dried with infrared lamps after varnishing. Sheets 45 in. x 30 in. are dried in five to seven seconds at a rate of 1000 to 1800 an hour. This same efficiency is reported for drying water gum coatings.

PRINTING INKS. *Paint Manufacture* 25, No. 6, June, 1955, pages 235-236 (2 pages). This article describes faster drying of inks gotten by atomic radiation and using styrenated products. The subjects of misting, quick-set varnishes, fading problems, and control tests are also covered briefly.

*THE INFLUENCE OF PAPER ON THE OXIDATION DRYING OF PRINTING INKS. II. THE INFLUENCE OF CERTAIN PAPERMAKING VARIABLES. R. R. Coupe and O. Jansen. *Paper-Maker* (London) 128, 1954, page 407; *Chemical Abstracts* 49, No. 9, May 10, 1955, column 6604. The degree of bearing and the amount of size and alum used did not have a significant effect on the drying of ink on a bleached sulfite paper. Ink drying time was greater for paper which had been conditioned and printed at higher relative humidity and for paper stored at higher relative humidity after printing. Paper-Maker is published at Graham House, 3 Tudor Street, London E. C. 4, England.

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IV. Lithography — General

GENERAL

SPRAY POWDER CAUSES THE DISAPPEARANCE OF HALF-TONE DOTS. J. Polderman, *I.G.T. Nieuws* 7, No. 2, February, 1954, pages 27-28 (in Dutch). Traces of hypochlorite left in the powder used in the sprayer oxidised the copper of a bimetallic plate, which was then dissolved by the acid in the water tray on the press, thus causing the gradual disappearance of the half-tone dots. *Printing Abstracts* 9, No. 5, May, 1954, page 1599.

HOW THEY DO IT ON STONE. *Modern Lithography* 22, No. 5, May, 1954, pages 42-45 (2 pages). George Miller, New York lithographer whose whole operation still is centered around hand stone presses, has outlined highlights of the step-by-step process for preparing a stone and printing with it.

BETTER PRINT TRANSFER. H. J. Seel. *Share Your Knowledge Review* 36, No. 3, December, 1954, pages 18-24 (7 pages). Most offset presses print from bearers. The advantages are simplification of operation and maintenance and better control of ink transfer. With bearers the gear teeth are in proper contact at the pitch line. Backlash gear adjustment never needs to be changed. Without bearers the distance between cylinders can change and backlash requires adjustments. Bearing wear is more troublesome without bearers. Cylinder deflection is constant when printing from bearers. Without bearers, cylinder shafts bend slightly during the impression and straighten out in the gap. Without bearers, meeting of the cylinders after the gaps disturbs the impression and may reduce quality.

PHOTOLITHO NOTES. J. S. Mertle. *National Lithographer* 61, No. 8, August, 1954, pages 40-41 (2 pages). Brief notes on recent and past developments of interest to the graphic arts. Included are a new electro-opti-

cal device developed at National Bureau of Standards for obtaining "sharp" prints from fuzzy negatives, color proving techniques, bimetallic plates, watercolors, casein sensitizers, bichromated colloids, and mechanical development of albumin plates.

* FORMATION OF GUM SALTS BY CATION EXCHANGE. *U.S. Patent 2,694,057*. D. N. Adams. *Official Gazette* 688, No. 2, November 9, 1954, page 370. 1. A process of forming a salt of a natural exudate gum, comprising applying ammonium hydroxide to a previously acid-treated carboxylic type synthetic resin cation exchange complex of high molecular composition of a non-metallic element of the fourth periodic group, and breaking up gum arabic and forming ammonium arabate from the gum acid radical by reacting the gum arabic in water with such carboxylic type cation exchange complex.

PHOTOLITHO NOTES. J. S. Mertle. *National Lithographer* 62, No. 2, February, 1955, pages 36-37 (2 pages). A new term is needed to describe the method of composing type and text by photography. The present terms, phototypesetting, photography, etc., are too unwieldy and confusing. The Ludlow Typograph Co. has introduced a new system, called "Brightype," of making direct line reproductions from letterpress printing surfaces. By using a set of color filters in conjunction with a chart, color correcting and matching can be specified and discussed in relation to the filters used to examine the work. The German firm Wilhelm Hostert and Sons has introduced the "Repromat." This machine automatically develops sheet film up to 18″x 24.″ Hutson K. Howell has devised a one solution process for image reversal on film.

COMPOSITION FOR OFFSET LITHOGRAPHY. *National Lithographer* 61, No. 11, November, 1954, pages 32-36 plus nine pages of specimens for a total of fourteen pages. Descriptions of the latest machines and methods devised for the production of type characters to be reproduced by offset.

THIRTY NEW PLANTS. *Printing Equipment Engineer* 85, No. 6, March, 1955, pages 47-70, 72-73, 80, 82 and 84 (29 pages). Illustrated descriptions of commercial, publication, newspaper, book and platemaking plants which have been built recently, are now in process of construction or will be erected soon. Those included are: William Feather Co., Progress Litho Co., Magill-Weinsheimer Co., Standard Printing Co., Alco-Gravure, Division of Publication Corp., Gordon Printing & Litho Co., Rochester (Minn.) Post-Bulletin, H. C. Young Press, Press-Enterprise, Camden (N. J.) Courier-Post, Gile Letter Service, Benton Harbor News-Palladium, Corydon M. Johnson Co., Raleigh News and Observer, Marathon Corp., Seaside Publishing Co., Master Engravers, Dayton Daily News, Augsburgh Publishing House, Clinton (Ia.) Herald, Tucson Newspapers, Inc., Rapid City (S.D.) Daily Journal, Peoria (Ill.) Journal-Star, Aurora (Ill.) Beacon-News, Alan S. Browne, Inc., Winona (Minn.) Daily News, Conroe (Texas) Courier, Corning (N. Y.) Leader and Houston Post.

SUBSTITUTES FOR LITHOGRAPHIC HEALTH HAZARDS. Melvin Gevert. *Lithographers Journal* 39, No. 12, March, 1955, pages 14-15 (2 pages). Article covers efforts of Union Committee to detect harmful chemicals and solutions used in litho plants; to find substitutes; to minimize chance of dermatitis when no substitute was available. Use of Kerodex, protective hand cream, is discussed. Materials checked included etches, fountain solutions, solvents for cleaning film, press rollers, and blankets, plate image removers, harsh soaps, and turpentine.

CORRECT YEAR-AROUND AIR CONDITIONING NECESSARY. C. F. King. *Inland Printer* 134, No. 6, April, 1955, pages 58-59 (2 pages). Standard conditions of temperature and relative humidity are essential in the lithographic industry. In recent years there has been a trend away from central air conditioning installations to package units. Besides eliminating ductwork, package units are easily adapted to various conditions with cheaper initial costs. Operating expenses and the cooling water problem are also briefly discussed. The use of air cooled condensers is proposed.

HUMIDITY CONTROL IN LITHO. *Modern Lithographer and Offset Printer* 51, No. 1, January, 1955, pages 34, 36 and 37 (3 pages). The author set down the basic conceptions of humidity with its definitions and general values. The reasons given for air conditioning in lithography are (a) photographic and platemaking processes and (b) printing aspects. A description of the practice of air conditioning in which the various processes of heating, cooling, humidification, dehumidification, filtering, and adding fresh water are discussed.

ELIMINATION OF GUESSWORK IN COLOR REPRODUCTION. *Lithographers Journal* 40, No. 1, April, 1955, page 15. By running a halftone step tablet with eleven steps in various combinations of the True Color Process Inks on uncoated and coated paper, a total of 18,000 color squares is obtained. The Krug Litho Art Co. will market this True Color Process Guide. When used with the balanced True Color Process Inks, the guide will give an indication of the range of the four-color process as well as assist the various craftsmen responsible for maintaining good color reproduction.

INSTRUMENTS AND TECHNIQUES FOR STUDYING THE MICROSTRUCTURE OF PHOTOGRAPHIC IMAGES. G. C. Higgins and L. A. Jones. *Photographic Engineering* 6, No. 1, 1955, pages 20-32 (13 pages). Instruments are described for measuring visually the graininess of photographic images and for measuring objectively the granularity of images in terms that will correlate with graininess. The customary method of measuring resolving power is outlined. The new concept of "acutance" which is defined operationally as the psychophysical correlate of the sharpness of an image, is discussed and a method of measuring it is described. The relationship between sharpness and resolving power is discussed briefly.

ACHIEVING COLOUR QUALITY. Eric J. Tongue. *Modern Lithographer and Offset Printer* 51, No. 3, March, 1955, pages 28, 30 and 32 (3 pages). This deals with the controlling of color on four-color process jobs. If possible run the black plate first, or at least a few sheets to check with other colors. Take a small rubber roller (an old pull-in wheel if possible) and take a sample of ink to be used, and roll it over a sheet of stock for a close color match. Also when putting ink in the fountain keep about four notches on the ratchet, for better control. Try to keep a sufficient amount of ink to cover the image and fill the grain of paper. Avoid overloading if possible.

ATMOSPHERIC CONDITIONS IN THE PRINTING PLANT. M. S. Kantrowitz. *Printing Equipment Engineer* 85, No. 4, January, 1955, page 38; *Bulletin of the Institute of Paper Chemistry* 25, No. 9, May, 1955, page 696. A canvass of the large printing plants in the United States made a number of years ago indicated a preferential R.H. of 50% and a temperature of 70-75° F. as the optimum conditions for operations. In a research program on the register of paper in lithography by the National Bureau of Standards and the Litho-

graphic Technical Foundation it was shown that the best results were obtained around 45% R.H.

HOW TO BUILD AN OFFSET PLATE RACK. *Modern Lithography* 23, No. 4, April, 1955, pages 40-41 (2 pages). Explains with photos how to make plate storage racks with one inch pipe, using wire for hooks to hang plates. There is a double decker rack for small plates. The valuable feature of the rack is that the plates hang smooth and straight during storage.

PLATES

LITHURE PLATES MAY LEAD TO DIRECT LITHO PRINTING. *Canadian Printer and Publisher* 63, No. 12, December, 1954, pages 43 and 64 (2 pages). This article discusses the advantages and disadvantages of Lithure plates. It states that bi-metal plates may make possible a trend from offset to direct lithography.

PRESS: INK AND DAMPENING SYSTEM

A NEW DAMPING SYSTEM. *Modern Lithographer and Offset Printer* 50, No. 7, July, 1954, pages 32-33 (2 pages). A description of the Wagner system for dampening lithographic plates is given and a brief comparison with the Effusor Dampening System by W. G. Mullen is made. Essentially the Wagner system operates as follows. A fine metal screen, suspended in a frame, is steeped in a water reservoir and drops of water cling to the mesh. A vertical movement places the wetted screen in front of a row of jet orifices. The air jets blow the water from the screen to the plate in the form of a spray. The duration of this spray is timed to coincide with the rotation of the plate by a cam-lever system. Among the benefits claimed are improvement of quality and evenness of impression; brighter colors; saving of time; reduction of image abrasion; and simple installation and operation.

*MOISTENING FOR OFFSET PRINTING MACHINES. *German Patent 872,050.* Max Ras. *Tin Printer and Box Maker* 30, No. 352, May, 1954, page 12. A long receptacle is provided with a slot. Means is provided for projecting through the slot finely atomised water uniformly by means of an airstream on to part of an offset machine cylinder for moistening. A photoprint of this patent may be obtained from the U.S. Patent Office, Washington 25, D. C. for sixty cents.

*INKING AND MOISTENING MEANS FOR ROTARY PLANOGRAPHIC PRINTING MACHINES. *U. S. Patent 2,689,522.* Franklin E. Curtis. *Official Gazette* 686, No. 3, September 21, 1954, pages 567-568. 1. In a planographic or analogous printing machine wherein ink and a moistening solution are fed to a master in a machine to enable reproductions of an image on the master to be effected, a fountain into which ink may be introduced, a fountain into which a moistening solution may be introduced, at least one roller engageable with the master, a roller effective to pick up ink from the fountain therefor, another roller effective to pick up moistening solution from the fountain therefor, roller means for transferring ink to said at least one roller from the roller effective to pick up ink from said ink fountain, other roller means each slidably mounted in a pair of guide slots for transferring moistening solution to said one roller from the roller effective to pick up moistening solution from the fountain therefor, and means for regulating the pressure of at least selected of the rollers one on the other in the roller means effective to transfer moistening solution to said at least one roller to thereby regulate the amount of

moistening solution withdrawn from the fountain therefor, said last-named means including pressure pins in said guide slots adapted to adjust the lower of said rollers slidably mounted therein, and adjusting screws having ends engaging the lower ends of said pressure pins, the engaging ends of said pressure pins and said adjusting screws being tapered to permit, through adjustment of said screws, selective movement of the pressure pins relative to said lower roller.

* MOISTENING DEVICE FOR THE PLATE CYLINDERS OF PRINTING PRESSES. *U.S. Patent 2,689,523.* Werner Koch. *Official Gazette* 686, No. 3, September 21, 1954, page 568. 1. In a moistening device for moistening the plate cylinders in printing machines, a plate cylinder, a liquid receptacle, a hollow cylinder revoluble in said receptacle adjacent said plate cylinder about an axis parallel to the axis of said plate cylinder and with its lower part submerged in the liquid, radial perforations in the wall of the said cylinder of a kind to take up from the receptacle dabs of liquid and to carry them around during the revolution of the said cylinder, a take-up roll for spreading the liquid over said plate cylinder adjacent its inner wall and delivering directly through the said perforations to thereby blow the said dabs of liquid against the plate cylinder, an adjustable shield for screening off parts of the ejected liquid, a spring-controlled two arm lever pivoted to the axle of said cylinder carrying said shield upon one of its arms and a bearing surface for cooperation with an adjusting member on the other, and means for adjusting said cylinder together with its nozzle and screening device in relation to the said plate cylinder independently of the said liquid receptacle.

FOUNTAIN DOPE. J. D. Payne. *New England Printer and Lithographer* 17, No. 10, November, 1954, pages 26 and 28 (2 pages). The dampening system can be a major cause of headaches when running a press. Although settings of dampers vary with models of presses, certain observations of damper system adjustment and operation can be made. First damper rollers must be true cylinders and their surfaces concentric with the spindles. Second basic requisite is to have clean dampers. In setting damper rollers be sure both ends of the rollers are set in the same direction. The pH of the fountain solution must be adjusted to the type of ink and paper that is being run. There are many methods to regulate the amount of moisture getting to the plate, but the best is to have clean, even and properly set dampers.

LITHOGRAPHIC PRESS INK DISTRIBUTION STUDIES BY RADIOTRACER TECHNIQUES. J. R. Bradford. *TAGA Proceedings,* Sixth Annual Meeting, 1954, pages 91-94 (4 pages). An analysis was made of ink flow on rollers of lithographic presses by mean of radioactive tracers. The investigation involved a study of the rate of exchange of printing inks on steel and rubber rolls, and the measurement of ink film thicknesses during press operation. A mathematical analysis of an ink distribution system was made and radiochemical and analytical data evaluated. Copies of the TAGA Proceedings may be obtained from the Secretary-Treasurer, George Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Massachusetts, for five dollars each.

GROWTH OF RADIOISOTOPE UTILIZATION IN INDUSTRY AND ENGINEERING. MEASURING INK ON PRESS ROLLERS. P. C. Aebersold and C. E. Crompton. *Modern Lithography* 22, No. 10, October, 1954, pages 57 and 60. Ink film thickness on rollers was measured under dynamic conditions by plating the rollers with Ni63 followed by a thin layer of copper.

EMULSIFICATION. *Modern Lithographer and Offset Printer* 50, No. 8, August, 1954, pages 13 and 26 (2 pages). A summary of a PATRA report on the effects of fountain water on print quality in lithography. The report concludes that the presence of surface moisture on the ink is of greater significance in causing the deterioration of the appearance of the print than the presence of emulsified water in the ink. In their experiments, the combined effect of surface and emulsified water caused the greatest deterioration of print quality.

CARE AND USE OF PRINTERS ROLLERS. *Lithographers Journal* 39, No. 8, November, 1954, pages 14-18 (5 pages) (Reprinted from Research and Engineering Council's publication). The article is broken down into the following sections: Function, Types of Rollers, Characteristics of Rollers, Roller Troubles and Failures, and Cleaning. It was prepared to make available up-to-date information concerning rollers used in the graphic arts industry. Mainly the function of printers' rollers is to transfer ink to the form or image to be printed. These rollers may be vulcanized-oil, leather (grain or nap surface) and synthetic rubber. Dampener rollers are used to moisten the plate in offset printing. Rollers should have the following characteristics: 1. physical durability, 2. ink receptivity, 3. ink stability, 4. hardness or softness and 5. chemical stability. The article explains in detail the above mentioned characteristics of each roller used in the graphic arts. Roller troubles and failures take many forms, such as crack or cavities in the surface of the roller and internal breaks where two compositions are molded together may occur. Surfaces must be ink receptive in order to distribute ink satisfactorily, so the important practice is to keep the rollers clean and in proper working condition.

* DEVICE FOR CLEANING INKED PRINTING SURFACES OF ROTARY DUPLICATING MACHINES. *U.S. Patent 2,704,029.* H. F. George. *Official Gazette* 692, No. 3, March 15, 1955, pages 309-310. 1. A device for cleaning inked surfaces of rotary printing machines having a blanket cylinder, said device comprising a wiping member pivotally movable into and out of operative contact with the surface to be cleaned, a container for storing the cleaning solution, a conduit, one end of which is connected to the container and the other end of which is adjacent the wiping member to direct the flow of cleaning solution therebetween, a normally closed spring urged valve located in said conduit between said container and said wiping member for preventing the flow of the solution through the conduit, a vertically disposed rod movable to engage and open the valve, and a hand lever for controlling the pivotal movement of the wiping member toward and away from the surface of the cylinder, said hand lever engaging said rod and serving to open the valve when actuated to wiping position.

* PLANOGRAPHIC PRINTING PRESS AND A PROCESS OF PRINTING. *British Patent 719,239.* W. H. Wood and H. A. Pritchard. *Printing Abstracts* 10, No. 2, February, 1955, page 73. The difficulties involved in applying the ink-repellent material by means of rollers are indicated. These are claimed to be overcome by using electric force to convey the finely-divided material (e. g., water which may contain gum arabic, phosphoric acid, chromic acid, etc.) to the printing plate.

DISPOSABLE DAMPENER ROLL COVERS. J. F. Dowdall and Frank Ireland. *Modern Lithography* 23, No. 2, February, 1955, pages 41-42. This

article describes the paper dampener covers developed by the Printing Products Division of Minnesota Mining and Manufacturing Co. It has been found that 45 pound pure vegetable parchment is a useful weight from the standpoint of durability, ease of application and press operation. Among the advantages listed are that covers are inexpensive, simple and fast to apply, remain clean on press, lint free, and transfer water very uniformly. Disadvantages are that they are difficult to use on large presses, must back up press carefully, drying over-night results in shrinkage, and seamless molleton covers must be used for long usage.

* DEVICES FOR MOISTENING ROTATING ROLLERS. W. Koch. *British Patent 714, 409. Printing Abstracts* 9, No. 11, November, 1954, page 759. A device for moistening the peripheral surface of a rotary roller by the action of compressed air on a liquid carrier from which the liquid is blown comprises a perforated hollow cylindrical liquid carrier rotatable in a liquid, a compressed air eiector located within the cylinder and a freely rotatable roller in contact with the peripheral surface of the rotating roller to distribute the blown liquid evenly over the surface.

* REGULABLE MOISTENING OF ROTARY PRINTING PLATES. *British Patent 714,326.* Faber and Schleicher A. G. *Printing Abstracts* 9, No. 11, November, 1954, page 758. The disadvantages of the usual spray moistening devices are: (1) the nozzles soon become obstructed by the impurities in the water, and (2) the water mist produced is not sufficiently even when a large number of nozzles are employed. The invention provides an arrangement in which compressed air is forced on to a liquid carrier. The distance between the liquid carrier and the printing plate can be varied. The liquid carrier may consist of a belt which travels over a doctor, preferably driven at a regulable speed.

* DAMPENING MECHANISM FOR LITHOGRAPHIC OFFSET PRESSES AND THE LIKE. *U.S. Patent 2,708,874.* Joseph Schultz. *Official Gazette* 694, No. 4, May 24, 1955, page 454. 1. Mechanism for moistening rollers of lithographic presses, for use between moisture supply means and a dampening roller spaced from the moisture supply means, comprising a moisture-receptive and moisture-dispensing member, and teeter means mounting said member on an axis for up and down pivotal movements on the axis toward and from the moisture supply means and said dampening roller, the member with its moisture content being disposed on the mounting means on one side of the axis and the mounting means being counterbalanced on the opposite side of said axis thereby to form a balance-like structure automatically controlling, according to the amount of moisture content in the member, the direction of pivotal movement of the member either for moisture pick-up or moisture dispensing.

NEW MATERIALS FOR DAMPENING ROLLERS. Norman A. Mack. *Graphic Arts Monthly* 27, No. 4, April, 1955, pages 70, 72, 136, 138 and 140 (5 pages). The author announces a new covering material in the form of a long two-way stretch finely knit soft cotton sleeving. This is simply pulled over a molleton roll cover, cut to the correct length, and tied in place. A chemical impregnation is mentioned. Among the several benefits claimed is a statement that a reduction of fifty per cent in the amount of fountain solution required is realized in use. The trade name of the product is "Dis-Cover," (for disposable dampening roller cover).

COMBINATION PRESS ROLLERS PERFORM VARIETY OF JOBS. E. B. Davis. *Inland Printer* 134, No. 4, January, 1955, pages 36-37 (2 pages); *Printing Abstracts* 10, No. 4, April, 1955, page 197. The advantages of this type of roller, which has a natural or synthetic rubber base covered with a thin replaceable layer of composition, are outlined.

* PROCESS FOR MAKING SOFT PRINTING ROLLERS FROM POLYVINYL CHLORIDE GELATINISED TO A RUBBER LIKE MASS. *Swiss Patent 274,264.* Ulvsunda Gummifabriks Aktiebolag. *British Plastics Federation Abstracts* 10, No. 1, January, 1955, page 84; *Printing Abstracts* 10, No. 4, April, 1955, page 198. A printing roller produced from plasticized polyvinyl chloride is coated with a layer of polyvinylidene chloride.

PRESSES

A NEW AID TO PRESSWORK. *Graphic Arts Progress* 1, No. 2, March-April, 1954, page 1. An "Ink Distribution Meter" to be used for controlling ink fountain adjustment on the press has been announced at the GARD Photographic Laboratory. The device is a Welch Densichron densitometer mounted on a traversing mechanism which draws it across the press sheet. In place of the usual meter three colored lights flash when the density is low, correct, or high.

* IMPROVED OFFSET ROTARY LITHOGRAPHIC PRINTING MACHINE. *British Patent 710,871.* Ditto, Inc. *Tin Printer and Box Maker* 30, No. 356, September, 1954, page 10. A feed table and a receiving tray are both located in front of a cylinder adjacent the bottom and top thereof respectively. A blanket roll is in the rear of the cylinder, which latter is rotated in a direction to move a sheet fed to the bottom of the cylinder and to deliver it to the receiving tray with its surfaces reversed in relation to its position on the feed table, the printed surface of the tinplate being uppermost in the receiving tray.

* IMPROVED OFFSET ROTARY LITHOGRAPHIC PRINTING MACHINE. *British Patent 710,872.* Ditto, Inc. *Tin Printer and Box Maker* 30, No. 356, September, 1954, page 10.

* IMPROVED OFFSET ROTARY LITHOGRAPHIC PRINTING MACHINE. *British Patent 710,873.* Ditto, Inc. *Tin Printer and Box Maker* 30, No. 356, September, 1954, page 10.

CLOSER REGISTER POSSIBLE ON WEB PRESSES WITH NEW TENSION MEASURING DEVICE. *Printing Monthly* 6, No. 8, November, 1954, pages 6-7 (2 pages). Link Engineering Company of Detroit has adapted a tension measuring device, the "Lod-Cap," originally developed for rubber industry, for use on paper rewinders and web presses. Air pressure, supplied from factory at 60 pounds minimum pressure, balances forces at one end of an idler roller through a diaphragm and valve arrangement. The sensing element output can be fed to recorder-controller for automatic control of tension. Response to variations is said to be very good.

DEVELOPMENT OF NONCIRCULAR GEARS IN THE PRINTING INDUSTRY. A. A. Hess. *TAGA Proceedings*, Sixth Annual Technical Meeting, 1954, pages 122-129 (8 pages). The applications considered in this paper are drawn from the field of proven printing machinery enjoying a reputation of satisfactory performance over a period of years. The specific items considered are sheeters, sheet slow down mechanisms, sheet transfers, and flat bed press drives. Comparisons are made between non-

circular gear mechanisms and more conventional devices used to achieve analogous results. From these comparisons an insight can be gained as to when noncircular gears can be profitably employed. The technical aspect of noncircular gear design and production is considered only to a limited extent since this subject has received detailed attention from other authors. TAGA Proceedings may be purchased for five dollars each from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Massachusetts.

THE FINAL STEPS OF MAKEREADY AND THE WASH-UP. C. W. Latham. *American Printer* 135, No. 12, December, 1954, pages 38-39, 70, 72 and 74 (5 pages). This is one of a series of articles on makeready and explains the final steps of makeready and the wash-up at the end of run or end of day. The part on makeready tells of getting the final lay and color okay. The use of too few waste sheets and the continued use of the ink knife during a makeready gives a sloppy job. Wash-up as makeready is a necessary down time on a press. The cost of wash-up may be cut by putting on a night wash-up crew, and allowing the press to run right to quitting time. Wash-up may be done with kerosene if the job is to continue on the same color or if a color change is to be made, the new three-solution wash-up may be used. The washing of dampeners does not hold up press time, for most presses have two sets. They may be washed with detergent or special cleaning solutions may be used.

OPERATING LARGE HARRIS PRESSES. Part 7. Roy Tyler. *Harris Impressions* 15, No. 1, January-February, 1955, pages 1-5 (6 pages). Describes the new ink roller system, how to set and adjust the rollers from the ductor to the form roller.

* ADJUSTABLE GEARING. *U. S. Patent 2,694,941.* W. R. Spiller. *Official Gazette* 688, No. 4, November 23, 1954, page 711. 1. In a printing machine of the character described, two coaxial elements, namely a cylinder and a gear, said elements being capable of limited relative oscillation while rotating, power means for driving one of said elements, a fixed cam surrounding the axis of said elements, a lever pivotally mounted on one of said elements, a follower carried by said lever running on said fixed cam, an arcuate cam track spaced from the lever pivot and mounted on the second element, and a second follower carried by said lever running on said cam track, said cam track being adjustable to a position crossing the arc of movement of said second follower, whereby the speed of rotation of one of said elements is varied positively and negatively during each cycle by the oscillation of said lever due to the action of said fixed cam.

PRE-MAKEREADY ON YOUR OFFSET PRESS. C. W. Latham. *American Printer and Lithographer* 136, No. 1, January, 1955, pages 50, 53, 56 and 59 (4 pages). Making sure equipment and supplies all along the line are in good order, in adequate supply, and in the right place can save time and money. Plate department can help the pressman by marking the plates to correspond with other markings on the press cylinder. Other specific examples of ways to save press time are given.

RUNNING AN OFFSET PRESS. C. W. Latham. *American Printer and Lithographer* 136, No. 2, February, 1955, pages 42, 45 and 46 (3 pages). Every good pressman should know how to handle and keep in good order equipment and supplies that relate to the press. Article discusses troubles that might arise and how to cope with some of them.

LITHOGRAPHIC PROOFING. B. E. Tory. *Graphic Arts Monthly* 27, No. 5, May, 1955, pages 76, 78, 80, 82 and 84 (5 pages). Proof and production press proofing and photographic methods are discussed. Plates must be made and colors adjusted so that proofpress proofs are similar to results possible during the production run. Color bars are included on all plates and inks are carefully weighed out on accurate scales.

THE RUBBER BLANKET — THE HEART OF OFFSET PRINTING. W. König. *Der Polygraph* 8, No. 1, January 5, 1955, page 18 (in German); *Printing Abstracts* 10, No. 4, April, 1955, page 197. The qualities required in a rubber blanket, ways of testing them, the care of blankets and printing pressure are discussed.

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V. Graphic Arts — General

GENERAL

*MEANS FOR CHECKING SUPERPOSED IMPRESSIONS ON A MOVING WEB, U.S. *Patent 2,686,153*. J. J. Bogert. *Official Gazette* 685, No. 3, August 17, 1954, page 566. 1. An apparatus for observing successive printed designs equi-distantly spaced on a moving web, comprising a rotary reflecting member having a plurality of light reflecting surfaces extending across such web, observing means positioned to view said reflecting member, a first Selsyn motor to drive said rotary member successively to present said light reflecting surfaces by its rotary movement to receive and reflect successive light rays from the moving designs, a second Selsyn motor electrically connected to said first Selsyn motor, means to rotate said second Selsyn motor in synchronization with the movement of said web thereby to rotate said first Selsyn motor in synchronization with the movement of said web, a differential Selsyn motor electrically connected between said first and second Selsyn motors, means to rotate the rotor of said differential Selsyn motor to change the phase of said first Selsyn motor in predetermined manner with respect to the phase of said second Selsyn motor thereby to adjust the relative position of said light reflecting surfaces with respect to said web, means to move a portion of such printed web in a straight observable path and means to observe an area adjacent the portion of such web moving in a straight observable path, said means comprising an arm, a pair of inclined reflecting mirrors on such arm, one of said mirrors having its reflecting surface directed towards such area adjacent the web to reflect rays of lights therefrom onto said second mirror, and said second mirror having its reflecting surface directed toward said observing means to reflect the rays of light thereto.

SKIN PROTECTION. *Printing Equipment Engineer* 84, No. 5, February, 1954, page 67; *Printing Abstracts* 9, No. 6, June, 1954, page 459. Two barrier creams, Clerex and Hydrepel AS, have been developed by Hygiene Research Inc., New York, N.Y., and Los Angeles. Clerex protects the skin from organic solvents and solvent-borne irritants. Hydrepel AS gives protection from water solutions and water-borne irritants.

AIR CONDITIONING. C. W. Latham. *American Printer* 135, No. 3, March, 1954, pages 36-37, 67-68 (4 pages). The need for air conditioning

in pressroom, plateroom, stripping, photo, finishing departments, offices, and storage is discussed.

HOW MUCH DOES AIR CONDITIONING COST? C. W. Latham *American Printer* 135, No. 4, April, 1954, pages 34-35, 58 and 60 (4 pages). This second installment covers factors influencing the cost, the requirements, the influence of geography on the cost, maintenance, and getting the full benefit out of air conditioning.

* ANTISTATIC FINISHES FOR TEXTILES. Mason Hayek. *American Dyestuff Reporter* 43, No. 12, June 7, 1954, pages 368-71; discussion, 371; *Bulletin of the Institute of Paper Chemistry* 24, No. 12, August, 1954, pages 1011-1012. The fundamentals of static electricity on textiles are reviewed, and the mechanisms of antistatic action are described. To be generally effective, antistatic agents must reduce the electrical resistance of textile surfaces. The manner in which this is accomplished by various compounds is discussed. 5. tables, 3 figures, and 36 references. American Dyestuff Reporter is published by Howes Publishing Co., Inc., 44 East 23rd Street, New York 10, New York.

* DERMATITIS FROM WATERLESS HAND CLEANERS. G. E. Morris. *AMA Archives of Ind. Hygiene and Occupational Medicine* 9, June, 1954, page 507; *Telescoping the Technical News* 14, No. 8, July 30, 1954, page 192. Waterless hand cleaners have recently appeared on the market and are being offered to industry both in tubes for individual use and in dispensing units which can be fastened to factory walls in places where no water connections exist. These waterless hand cleaners are gradually being used with increasing frequency by machinists, mechanics, painters, and others with dirty hands, because they appear to clean the skin efficiently without the need of washing or rinsing with water. Nine cases of vesicular dermatitis of the hands are reported from the use of waterless hand cleaners, the cleansing ability of which is based primarily on the use of solvents. Such solvents are of the naphtha series and are potent irritants and sensitizers; therefore, they should not be used as hand cleaners. Waterless hand cleaners which are used in industry are based, in large percentage, on aliphatic hydrocarbons, which are both irritants and sensitizers. They represent an expensive method of using kerosene as a skin cleaner. The AMA Archives of Industrial Hygiene and Occupational Medicine are published by the American Medical Association, 535 North Dearborn, Chicago, Illinois.

* PHOTOCOMPOSING MACHINE. *U.S. Patent 2,691,924.* James C. Plastaras. *Official Gazette* 687, No. 3, October 19, 1954, pages 540-1. 1. In a photocomposing machine of the class described, wherein a composed line of matrices bearing photographically reproducible characters is delivered and justified between a pair of line clamping jaws during each machine cycle of operation, the combination of an extensible camera arranged to photograph the justified matrix line, said camera including a head, a lens carrier and a film holder detachably secured to the camera head, a rotatably adjustable drum provided with two sets of stop elements whereby the camera may be set in different focusing positions, film feed mechanism capable of adjustment for different line spacing, adjustable means for limiting the area of the film to be exposed under the different camera settings, and a single rotatably adjustable control dial appropriately labeled and operable at will to simultaneously effect the adjustments of the focusing

stop drum, film feed mechanism and the means for limiting the area of the film to be exposed.

* ELECTROPHOTOGRAPHY. *U. S. Patent 2,690,394*. Chester F. Carlson. *Official Gazette* 686, No. 4, September 28, 1954, page 880. 1. In electrophotographic apparatus, the combination with an electrophotographic plate consisting of a conductive base and a layer of photoconductive insulating material supported by said base and in contact therewith throughout an image area, of a conductive electrode in spaced parallel relation to the face of said layer in said image area, means to introduce charged particles between said layer and said electrode to develop said electrostatic latent image, and a potential source connected between said conductive base and said electrode.

TESTING COLOR APTITUDES OF PROSPECTIVE AND ACTUAL PRINTING PRODUCTION EMPLOYEES AND THE STATISTICAL IMPLICATIONS. Donald Macaulay. *TAGA Proceedings,* Sixth Annual Meeting, 1954, pages 95-103 (9 pages). This paper describes three applications of the Color Aptitude Test prepared by the Inter-Society Color Council under the direction of Dr. F. L. Dimmick and C. E. Foss, co-chairmen. A photograph is shown. In addition, a complete description is given on how it was used, not only for the selection of Statistical Quality Control inspectors in three printing plants, but how it was used to evaluate other printing production divisions, such as day and night pressmen, camera, art, and management. Three case histories are illustrated and comparisons are made against the original statistical standards set by the Color Aptitude Test Committee. Copies of the Proceedings may be obtained from Geo. Hammer, Forbes Litho Mfg. Co., P.O. Box 513, Boston, Mass. for five dollars.

ELECTRONICS AS AN AID TO REPRODUCTION. Eric Chambers. *Process Journal* 10, 1954, pages 9-11, 13-15, 17-19, 21-23 and 25 (13 pages). The application of electronics to the graphic arts is surveyed. The following are discussed: the Photon Typesetter, the Klischograph electronic engraving machine for newspaper engravings, the Fairchild Scan-a-Graver and Scan-a-Sizer, Roneo Electronic Stencil Machine, the Times Stenafax Machine, the Time-Life and R.C.A. Color Scanners.

LUBRICATION OF MODERN PRINTING MACHINERY. A. F. Brewer. *American Printer* 135, No. 9, September, 1954, pages 21-23 and 52 (4 pages); No. 11, November, 1954, pages 27-31 (5 pages). Author discusses centralized systems of automatic lubrication which leads to better press maintenance and cleaner press rooms. The concluding article discusses types of lubricating systems as applicable to certain types of presses. Effective lubrication is a must for profitable business.

THREE-D PICTURES WITHOUT GLASSES. Tom Cameron. *Pacific Printer Publisher and Lithographer* 91, No. 3, March, 1954, page 11. The possibility of producing stereoscopic images on flat paper which may be viewed without glasses or other special optical equipment was announced by Paul A. Hesse and Harvey Prever. The process is based on the Bonnet and Butement systems. Essence of the process is a simplified process for taking multiple-image photographs through a lenticular screen placed over a film or plate. They are now working to produce the viewing screen by press impression rather than applying it by hand.

ELECTRICAL EQUIPMENT MAINTENANCE. H. J. Mitchell. *Printing Equipment Engineer* 85, No. 3, December, 1954, pages 98-100 (3

pages). General methods for easier and better preventive maintenance are discussed. Subjects covered include (1) cleanliness, (2) inspection and (3) the maintenance of bearings, brushes, rings, and windings of motors used on printing presses.

WHAT'S NEW IN THE GRAPHIC ARTS? *Share Your Knowledge Review* 36, No. 4, January, 1955, pages 14-24 (11 pages); from *Pacific Printer,* July-August, 1954. Excerpts from talks at a Pacific Society Conference Panel which gave significant developments within the different phases of the industry. Included are: Photoengraving Advances; New Method of Mounting Plates; Modern Color Reproduction; Faster Drying Printing Inks; Electronic Justification; Quality Control in Paper; Newspapers-Pioneers in Color; Commercial Use of Teletypesetter; and Engraving by Electronics.

PRINTERS AND LITHOGRAPHERS ENJOY RECORD BEST FINANCIAL CONDITION. P. B. B. Andrews. *American Printer and Lithographer* 136, No. 3, March, 1955, pages 35-36 (2 pages). The final quarter of 1954 found the printing and publishing industry in its strongest financial situation. A detailed cross section of the current financial position is presented.

PROPOSED CURRICULUM FOR PRINTING MANAGEMENT (ENGINEERING OPTION) APPROVED. *Research & Engineering Coordinator* 1, No. 2, April, 1955, page 7. R & E Council Planning Committee approved a proposed curriculum and recommended it to the School of Printing Management of Carnegie Institute of Technology. Subjects offered are listed.

QUALITY CONTROL. H. Segall, L. Pollner and C. Henderson. *National Lithographer* 62, No. 3, March, 1955, pages 26-28 and one page of illustration (4 pages). This article consists of excerpts taken from talks by quality control experts of the Consolidated Lithographing Company at a joint meeting of Litho Club and Printing House Craftsmen of New York. Covered in the discussion are quality control measures in raw material ordering and in the pressroom.

TREATMENT OF POLYETHYLENE TO IMPROVE INK RECEPTIVITY. Ted Irving. *Paper Film and Foil Converter* 29, No. 6, June, 1955, pages 28-29 and 58 (3 pages). The surface of polyethylene must be treated before it can be printed, but over-treatment can damage the film or impair ink adhesion. This article discusses methods of treatment by (1) chlorination, (2) differential heat treatment, (3) oxidation, and (4) electronic treatment. Also discussed are precautions to observe in treating polyethylene to obtain the best results.

SYNTHETICS UP TO DATE. *Paint Technology* 19, No. 212, May, 1955, pages 177-178 (2 pages). Silicone wax applied over prints on polyethylene, though it will not actually increase the adhesion of the ink film, will give it a fair degree of abrasion resistance and enable it to pass the standard adhesive tape test for adhesion. British Patent 712,838 to B. Winstone & Sons, Ltd.

THE TECHNOLOGY OF PAPER COATING. Part IV (Conclusion). *Paint Oil and Chemical Review* 118, No. 10, May 19, 1955, pages 16-18, 20-22 and 40-42 (9 pages). Table of contents lists: (Organic Coatings for Paper-Concluded) H. Other Vinyl Type Coatings, 1. Polyvinyl Acetals, 2. Polyvinylidene Chloride, 3. Polyethylene, 4. Polystyrene, 5. Acrylic Resins; I. Rubber and Rubber Derivatives, 1. Cyclized Rubber, 2. Chlorinated Rubber, 3. Polybutenes, 4. Neoprene, 5. Other Synthetic Rubbers; J. Polya-

mide Resins; K. Miscellaneous Resins, 1. Plyesters, 2. Phenolic Resins, 3. Urea and Melamine Resins, 4. Silicone Resins, 5. Quilon, 6. Sulfonamide-Formaldehyde Resins, 7. Asphalts, and 8. Oleoresinous Varnishes.

*THE EFFICIENCY CONSIDERATIONS OF DRY DUSTING (ANTI-OFFSET SPRAY). Otto Warschun. *Druckspiegel,* January, 1955, pages 42-44, (in German); abstract from *Deutschen Gesellschaft für Forschung im Graphischen Gewerbe,* January, 1955. After the necessity of dry dusting was recognized two paths of development lay open: the search for a powder that would be least dangerous to health, which was found in FOGRA'S K4 powder; and the construction of a suitable duster. The solution to this problem was found in the PRINTAX duster. A comparison of the uses of dry and wet dusting materials since 1950 is given. Der Druckspiegel is published by Otto Blersch Verlag K.G., Stuttgart, Schottstrasse 107, Germany.

*LUBRICATION OF MODERN PRINTING MACHINERY. *Lubrication* 40, August, 1954, pages 93-104 (12 pages); *Battelle Technical Review* 3, No. 11, November, 1954, page 728a. Lubricants; lubricating systems; bearing requirements; photographs, diagrams. Lubrication is published by the Texas Co., 135 East 42nd Street, New York 17, N.Y.

CELLULOSE ACETATE FILM — THE MODERN GLOSSY FINISH; WHAT THE PRINTER MUST DO TO GET THE BEST FROM THE PROCESS. W. L. Nicholls. *Paper and Print* 27, Winter, 1954, pages 406-7 (2 pages); *Chemical Abstracts* 49, No. 9, May 10, 1955, column 6604. The lamination of a thin sheet of colorless cellulose acetate to printed paper provides a great degree of gloss and permanence, surface uniformity and freedom from color degradation.

*LACQUERING OF PAPER. Gerard Martin. *Papeterie* 77, 1955, pages 75-86, 159-71; *Chemical Abstracts* 49, No. 11, June 10, 1955, column 7853. Descriptive article dealing with alc.-sol. varnishes, cellulosic lacquers, and lacquers containing synthetic high polymers. Papeterie is published by L'Homme et Argy, 9 rue Lagrange, Paris (5e), France.

PROCESSES—GENERAL

*PRODUCING PHOTOGRAPHS ELECTRICALLY. *British Patent 679,-715.* Battelle Memorial Institute. *Abridgement of Specifications* Group XX, 1954, page 318. A method of making a powder image comprises producing an electrostatic charge image on an insulating image layer and flowing over the said layer a developer mixture of a powder which is attracted or repelled by electric charges and of a granular carrier, which powder and carrier are charged triboelectrically by contact with one another, said powder having a charge of opposite polarity and said carrier having a charge of the same polarity as that of the charge on the insulating image layer. The insulating image layer is either a photoconductive insulating layer (i.e. an insulating layer that is rendered conductive, when struck by light, at the parts so struck) on which an electrostatic charge image is produced by photographic exposure after uniform charging, or an insulating layer conforming in area to the desired image, the electrostatic charge image in this case being produced by charging the insulating layer.

GRAVURE OFFSET OFFERS NEW POSSIBILITIES. E. A. Crawford. *Inland Printer* 133, No. 6, September, 1954, pages 42-43 and 98 (3 pages). The advantages of gravure-offset are: first, no water is required to effect the ink transfer; second, deep-etched plates are not used, therefore there are no copy restrictions and

wash-ups are practically eliminated; third, photographic reproductions as fine as a 150-line screen can be reproduced; fourth, on normal, run-of-the-mill printing, far less skill is required to operate the press. However, where skilled craftsmen are employed, the printing result approaches that of high quality letterpress printing. Fifth, the ink on the printed surface dries sufficiently to permit lacquering on the same press run.

* XEROGRAPHIC CONTACT COPYING DEVICE. *U.S. Patent 2,689,179.* L. E. Walkup and H. E. Copley. *Official Gazette* 686, No. 2, September 14, 1954, page 405. 1. An exposure device for contact xerographic copying wherein a xerographic plate is held in contact with copy to be reproduced while being exposed to light, said device comprising a cabinet and a light source therein, a rigid transparent panel in a wall of the cabinet and a cover movable over said panel, a resilient, flexible, transparent pad positioned on the rigid transparent panel, and a thin, flexible, soft, transparent sheet secured to the cabinet and disposed to be drawn over the copy to be reproduced and adapted to receive a xerographic plate thereon, and a pressure plate resiliently mounted within the cover and positioned over the transparent panel to bear firmly against a xerographic plate when on the transparent sheet whereby the xerographic plate is firmly and resiliently retained in an exposure position.

* SENSITIVE PHOTOGRAPHIC ELEMENT FOR USE IN THE SILK SCREEN PROCESS. *U.S. Patent 2,685,510.* E. C. Yackel. *Official Gazette* 685, No. 1, August 3, 1954, page 174. 1. A photographic element for use in the silk screen process, comprising a cellulosic support having thereon a gelatino-silver halide emulsion layer, and on said emulsion layer a second gelatino-silver halide emulsion layer of the same composition as the first emulsion layer but containing colloidal silver dispersed therein, both emulsion layers containing a dispersion of a tanning developing agent.

* PRINTING PROCESSES. *British Patent 679,974.* W. C. Huebner. *Abridgement of Specifications* XVI, 1954, page 227. An image is reproduced on a sheet by depositing material from a smoke atmosphere, derived from products of combustion, in an electrostatic field having the configuration of the image to be reproduced.

* COMBUSTION PRECIPITRONIC PROCESS AND APPARATUS. *U.S. Patent 2,691,345.* W. C. Huebner. *Official Gazette* 687, No. 2, October 12, 1954, pages 324-325. 1. The method of producing an image upon image receiving material which comprises creating an electrostatic field of force extending through the said material with the lines of force of said field arranged in accordance with the configuration of the image to be produced, creating smoke by combustion of a smoke producing substance at a region remote from said field of force, and conducting the smoke into the region of influence of said field of force adjacent that surface of the said material on which the image is to be produced while the material is in said field, thereby causing the solid particles of said smoke to be deposited upon the image receiving material by the said lines of force. 7. An apparatus for repeatedly producing an image upon a web of image receiving material comprising a housing having an opening in one side thereof, a hollow rotatable image cylinder supported adjacent said housing with a portion of the surface of said cylinder positioned within said opening and substantially closing the latter, the surface of the cylinder including conductive image portions and non-conductive portions representing

non-image areas, electrode means stationarily supported within said cylinder, electrode means supported in said housing adjacent the surface of said cylinder but spaced therefrom, means for causing the image receiving material to move in timed relationship with said cylinder in a path extending between the surface of said cylinder and the said electrode means within said housing when the said cylinder is rotated, means for creating products of combustion in communication with said housing for providing an atmosphere of said products in the form of smoke in said housing, and means for supplying electrical energy of opposite polarity to said electrode means for creating an electrostatic field of force therebetween through which the web material and the surface of said cylinder move whereby the image is progressively sequentially formed by the depositing of opaque smoke components upon the moving material under the influence of the said electrostatic field the lines of force of which are sequentially arranged in accordance with successive portions of such image by the passage of the said conductive and nonconductive portions of said surface through the said field.

RESULTS OF A STUDY ON OFFSET COLLOTYPE. H. H. Lerner. *TAGA Proceedings*, Sixth Annual Meeting, 1954, pages 26-32 (7 pages). Continuous-tone printing as exemplified by the Collotype process is briefly explained together with a short history of its background both in this country and in Europe. Developments are brought up to date with the intrduction in America of the Direct Rotary Press about 1930 and early attempts to print the Collotype plate by offset. Although the principles of Collotype have been applied to the offset press, a new type of plate has been derived specifically for the purpose. The disadvantages of Collotype have been largely circumvented as a result. Long runs of high quality are now possible on grainless plates and without a water fountain on the press. The new plate was designed for the Army for the printing of aerial photos directly from the original aerial negatives without the intermediate steps of screening as in conventional offset. The continuous-tone image of the new plate shows excellent resolution of detail and tonal graduation on a par with Collotype. TAGA Proceedings may be obtained from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Mass., for five dollars.

MAKING PLASTIC TRANSPARENCIES AND REPROS. J. B. Heflin. *Graphic Arts Monthly* 26, No. 11, November, 1954, pages 66, 68, 70, 72, 77 and 78 (6 pages). The technique of pulling transparent proofs on plastic sheet using a proof press of the Vandercook 4-T type is discussed. Both black and white ink may be used, depending upon the required end-use of the proof.

* PRINTING PASTES FOR USE ON PLASTIC SHEETS. *U.S. Patent 2,686,736*. J. M. Kuhn. *Chemical Abstracts* 48, No. 22, November 25, 1954, Column 14245-6. An oil-in-water emulsion printing paste prevents off-set printing on the back of the plastic film, curling of the edges of the sheet, shrinking of the image, and fire danger from inflammable solvents. A monovinyl benzenemaleic anhydride copolymer (I) is dispersed in a terpene alc. (II) and solubilized with an aliphatic alc. (III) of 4-14 C atoms. The pigment is mixed with this solution. An emulsion is prepared by mixing the solution with water containing an alkyl amine or cyclic imine, such as morpholine. The emulsion is mixed with a vinyl latex, preferably vinyl chloride. The ratio of latex to pigment can vary from 2:1 to 1:2. The ratio of I to II ranges from 1:1 to 1:2. Only enough III is used to dissolve I.

* PROCESS FOR GIVING AN ILLUSION OF SOLIDITY. *British Patents 702,051 and 702,125.* R. L. de Montebello. *Photographic Abstracts* 34, Part 4, 1954, page 263. Solidity can be perceived without stereoscopic vision if the object is strongly lit to give deep shadows and intense highlights. A monocular photograph is therefore arranged to be lit from behind and also from in front but without special illumination. It is displayed in a viewing box with a deep projecting frame and gives the illusion of a solid object lit by a concentrated source concealed behind the frame. Two exposures are made from the same viewpoint, A with a concentrated source arranged to give deep shadows and intense highlights, and B with a flat wide source. Positive transparencies are made from the negatives and are mounted in a pack in the viewing box in the following order starting from the illuminant:-Glass; dense contrasty print from A; white chromated colloid layer (e.g., Eastman Kodak Transfax) showing an even white except for the extreme highlights which are transparent; print from B showing clear except for the densest shadows; thin print from B showing no detail in the highlights. The white layer forms a background against which the front transparency is viewed by reflection, in addition to the light transmitted by the highlights of all four transparencies. Alternative methods of producing the same effect in monochrome and color are described. A device for viewing the transparencies of this invention is described in British Patent 702,125.

SPEED UP FOR SCREEN PROCESS. *Kodak Bulletin for the Graphic Arts* 3, 1955, 2 pages. This article describes briefly how sheets printed by the screen process are dried in five seconds in a dryer. Hot air at the rate of 1300 cubic feet per minute is forced through a perforated plate in the dryer. The sheets pass continuously below this plate as they pass through the dryer.

* DEVELOPER COMPOSITION FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE. *U.S. Patent 2,638,416.* L. E. Walkup and E. N. Wise. *Monthly Abstract Bulletin* 40, No. 6, June, 1954, page 233. A developer composition for developing an electrostatic latent image of substantially homogenous polarity contains spherical carrier particles and pigmented resin powder particles which are loosely movable and electrostatically coated on the carrier particles. By mixing with the carrier particles, the powder particles acquire a charge of polarity opposite to that of the image. The powder particles can be electrostatically removed from the carrier surfaces by and to the charged portions of the electrostatic image, and are preferentially attracted by and to the carrier surfaces from the background portions of the image.

DRY OFFSET. Progress Report No. 2. D. W. Lewis. *American Newspaper Publishers Association Technical Report* No. 21, May 4, 1955, pages 1-4 (4 pages). It is the purpose of this report to briefly summarize the work done during the past eighteen months in the development of the dry offset process. This report covers the work that has been done on negative specifications, printing, and etching techniques including the application of the ANPA-Dow etching process to dry offset. The report also covers press, blanket, ink and paper requirements.

HANDLING PACKAGING FILMS ON THE PRESS. *Gravure* 1, No. 4, April, 1955, pages 38-39 (2 pages). This article describes gravure printing on packaging films. Packaging properties, press handling and ink

formulation for such materials are cellophane, pliofilm and saran, polyethylene, aluminum foil, and cellulose acetate are discussed briefly.

THE COLLOTYPE PROCESS. W. D. Wright. *Typographer* 17, No. 1, Winter, 1955, pages 13-24 (12 pages). A brief description of the Collotype process, the materials used, and the appearance of the image.

* PRINTING OF TRANSPARENT FILMS. E. H. Dock. *J. Inst. Packaging* 3, No. 26 (Exhibition convention report no.), 1955, pages 136, 138, 140 and 142; discussion, 142; *Bulletin of the Institute of Paper Chemistry* 25, No. 9, May, 1955, page 744. The author reviews the various methods of printing which have been used successfully on cellulose film, cellulose acetate, polyethylene, rubber hydrochloride, and polyvinyl chloride. Important factors in the printing of all transparent films are absorption, transparency, gloss, and flexibility; special mention is made of the hot-transfer process as capable of giving attractive results.

CHEMICAL REACTIONS RELATED TO THE PREPARATION OF GRAVURE CYLINDERS. James M. Dugan. *Gravure* 1, No. 1, January, 1955, pages 36, 38, 40-41, 43-44 and 57-58 (8 pages). The preparation of gravure cylinders involves several distinct fundamental chemical principles. Perhaps more than in any other printing process, good results depend on the proper control of these chemical reatcions in each of several steps in the process. This control is based on knowledge resulting from studies which have included: (1) the photo-chemical process by which carbon tissue is made light sentisitive so that it may receive a photographic image, (2) methods of retarding non-photo-chemical reaction that proceed after carbon tissue is made light sensitive, (3) the electrochemistry of plating cylinders with copper, (4) the metallography of the copper, (5) reactions that occur when copper is attacked by an etching solution to produce a printing plate, and (6) composition of an etching solution as it affects both the penetration through a thin membrane and attack on the metal.

LIQUID DEVELOPERS FOR XEROGRAPHY. K. A. Metcalfe. *Journal of Scientific Instruments* 32, No. 2, February, 1955, page 74; *Printing Abstracts* 10, No. 4, April, 1955, pages 213-214. In course of work with selenium-coated plates made at the Defense Standards Laboratories, South Australia, it has been found that development based on liquid dispersion media offers better control than either of the dry processes; furthermore, considerably shorter development times are possible. Liquids investigated include petrol, kerosene, turpentine, benzol, and carbon tetrachloride; they were selected because of their high resistivity, a property which is essential to avoid discharge of the latent electrostatic image. Many powders (including certain talcum powders, magnesium oxide, carbon black and a number of pigments) disperse freely in these liquids and in so doing acquire a charge the sign of which is characteristic of the powder. As examples, particles of "monolite yellow" pigment acquire positive charges and are attracted to negatively charged latent images; talcum powder particles acquire negative charges.

RESEARCH AND DEVELOPMENT

THE SENSITOMETRY OF CONTINUOUS TONE XEROGRAPHY. W. E. Bixby, P. G. Andrus and L. E. Walkup. *Photographic Engineering* 5, No. 3, 1954, pages 195-201 (7 pages). In 1948, the first general announcement was made of the dry photographic process called "electrophotography" or "xerography." While

good-quality line copy could be produced at that time, the quality of the continuous-tone images then produced could be called "recognizable" at best. Since 1948, research has been continued on many phases of xerography. Work, under the sponsorship of The Haloid Company, the U. S. Army Signal Corps, the U. S. Air Force, and The Battelle Development Corporation, has resulted in a considerable improvement in the art of producing continuous-tone reproductions.

CONTROLLED LABORATORY PRINTING TECHNIQUES. Jacqueline Fetsko, W. C. Walker and A. C. Zettlemoyer. *TAGA Proceedings,* Sixth Annual Meeting, 1954, pages 29-47 (9 pages). Laboratory study of the printed process requires careful control and measurement of such vital variables as printing pressure, speed, and ink film thickness. The techniques for handling these variables are reviewed, and a practical combination for controlled work on a proof press is selected. Static printing pressure is measured with a flexing bridge such as the Huck pressure sensitive base. Correlation of the static pressure with dynamic pressure has been made using strain gages and the Brush Strain Analyzer. Speed is handled by measuring the time of passage of the cylinder over the plate with an electric stopclock. The method selected for film thickness measurement is direct weighing of the ink on the plate after establishment that resting of the particular ink does not affect results. Use of these techniques in a constant temperature and humidity room has produced highly reproducible results. Copies of the Proceedings may be obtained from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Mass., for five dollars.

EVALUATION OF THE DIRECT IMAGE OFFSET PROCESS. Progress Report No. 1. S. W. Mabus. *American Newspaper Publishers Association* Technical Report 18, December 1, 1954, pages 1-4. (4 pages). This report explains the Direct-Image Offset process as a possible solution for small newspapers, particularly flatbed users, whose circulation is outgrowing production capacity. The Direct-Image plate is made of grained aluminum foil bonded to heavy card stock backing. To prepare the plate for printing, it is "proved" on a made-up type form, using a non-drying ink, which retains its affinity for ink after completion of the platemaking process. The plate is then given a light acid bite, gummed, and run through the Debosser to remove a slight embossing incurred during "proving." The report summarizes Direct-Image Offset process evaluation for further study. There are still some definite facts to be established to prove the process acceptable for newspaper printing.

PRINTING LINE VS. BEARER HEIGHT. B. L. Sites. *Share Your Knowledge Review* 36, No. 3, December, 1954, pages 34-37 (4 pages). A discussion of bearer height in relation to form height on flatbed letterpress machines. It is claimed that true rolling contact between form and paper when the pressure squeeze is .003-.004" is obtained when the bed bearer height is .010 to .015" below the form height.

SELF-LUMINOUS HALFTONES. F. A. Schwertz, M. N. Haller and J. J. Mazenko. *Journal of the Optical Society of America* 44, No. 9, September, 1954, pages 745-746 (2 pages). The phenomena of electroluminescence and xerography have been combined in a way which permits the production of self-luminous halftones. In brief, the distribution-in-density of a layer of electroluminescent phosphor powder is controlled by the xerographic technique, and the powder is caused to luminesce by subjecting it

to the action of an alternating electrical field. In preparing a self-luminous halftone, a sheet of NESA glass is first dip coated with a clear thermoplastic resin. The phosphor-powder pattern is then formed on a selenium plate by ordinary xerographic procedures, the distribution-in-surface density of the powder being controlled with the aid of a screened positive photo-transparency of the halftone subject. The plastic-coated NESA glass is then placed, conducting face down, on the selenium plate, and the phosphor pattern is transferred to the plastic coating by means of electrostatic forces which are produced by corona charging the face-up side of the glass sheet. The phosphor powder is then "fixed" by bringing the plastic coating up to its softening point and holding it there for several minutes. Finally, an aluminum electrode is vacuum evaporated over the phosphor layer. The halftone is then made to luminesce by applying an alternating voltage between the transparent conductive layer and the aluminum electrode.

* IMPROVEMENTS IN PRINTERS' BLANKETS. *British Patent 718,519*. Dunlop Rubber Co., Ltd. *Tin Printer and Box Maker* 31, No. 362, March, 1955, page 10. A printer's blanket has a low elongation in the longitudinal direction and comprises a rubberized fabric in which is incorporated a fabric ply of prestretched warp components, the ply having at most a low weft contact, and a ply of normal body fabric.

* COLOR MATCHING APPARATUS. *U. S. Patent 2,686,452*. E. P. Bentley. *Official Gazette* 685, No 3, August 17, 1954, page 566. A color matching device comprising a hollow reflecting sphere having therein an incandescent electric lamp as a source of white light, spaced mounts for the color samples in the wall thereof, whereby the samples are continuously illuminated, means for cutting off direct illumination of said samples by said source, separate openings each having stray light preventing means in said sphere from which light from the two samples separately emerges in converging beams, a photomultiplier tube, a mirror located in the common path of said beams, means for rotating and wobbling the same whereby first one and then the other of said beams is alternately and rapidly directed on said cell without cutting off either beam, an amplifier feedback network for preventing variations in voltage supplied to said lamp or tube from affecting the output of said tube, a commutator synchronized with said mirror rotating means for separating the output of said tube during the periods of elimination from one beam from those of the other beam, and a zero reading meter in which the integrated outputs of one beam are matched against the integrated outputs of the other beam whereby the presence and amount of mismatch is indicated.

* METHOD FOR DETERMINING AND MIXING COLORS. *U. S. Patent 2,666,716*. O Syreen. *American Ink Maker* 32, No. 4, April, 1954, page 47. A method of blending red, yellow and blue coloring materials to a desired color intensity and shade comprises determining the reciprocal color intensity of the given coloring components of the desired color to be obtained and then blending the colors quantitatively in the ratio of their reciprocal color intensities to produce the desired shade and hue. The reciprocal color intensity is determined by measuring the minimum critical quantity of the coloring material of unknown coloring power required to produce a coloring effect upon a substantially stronger color containing a shade-modifying quantity of a weaker color other than the unknown coloring material other than merely deepening the color thereof.

The stronger color is selected from the group consisting of bright red, bright yellow and bright blue, and the unknown color is the color of this group other than the stronger color.

COLOR TEST BOOTHS. P. R. Russell. *Printing Equipment Engineer* 85, No. 4, January, 1955, pages 29-30 (2 pages). A Color Test Booth, for color matching in the pressroom, is described as used by the Parthenon Press. The booth is large enough to accomodate the largest press sheet, and is fitted with fluorescent tubes, set at an angle of approximately 45° to the viewing surface. Three tubes of each of three colors (blue, green and red) and white are fitted to each side of the booth. Colored tubes are further modified by covering them with Rosco No. 15 (light red), No. 37 (dark urban blue) and No. 40 (medium green). Blue tubes are used for yellows, green for reds, red for blues, white for black, green or blue for browns, and red or blue for greens.

NEW COLOR PRINTING GUIDE. *National Lithographer* 61, No. 11, November, 1954, page 52. A news item on the revised edition of the Duo-Color Guide, 100 pages showing the actual results of 4200 two-color combinations in large printed patches, issued by Graphic Publishing Co. Inc., 240 W. 40th St., New York 18, N.Y. Each page shows every practical combination of one color with black, or of one color with key color. All the most effective colors are included. Every possible two-color combination of the four-color process colors is presented.

*METHODS OF PRODUCING HALFTONE PRINTING PLATES. *U. S. Patent 2,692,198.* Maurice D. Whitney. *Official Gazette* 687, No. 3, October 19, 1954, page 619. 1. A method of producing a printing plate from a photographic negative of a picture, for use in a printing press, comprising: placing a transparent spacing sheet over a light-sensitive gelatin silver salt emulsion carried by a backing plate, placing a varying density halftone screen over said transparent spacing sheet, placing said negative over said screen, passing light through the super-imposed negative, screen, and spacing sheet to expose said light-sensitive emulsion, then removing said sheet and completing the exposure with the screen in contact with said emulsion, developing the exposed positive emulsion to produce a positive image of said negative thereon, thence dissolving away the unexposed light-sensitive salts from said emulsion to cause a shrinkage of the latter in correspondence with the varying densities of said image, treating with acid bichromate solution for shrinking those portions of the gelatin from which the unexposed salts have been dissolved to produce an indented printing surface on said backing sheet, then hardening the emulsion by treating the same with a solution of potassium iodide and iodine, and thence applying printing ink to the protuberances of said surface, so that said ink will offset against a sheet brought into contact with said surface.

A RAPID ENGRAVING PROCESS. D. L. Goffredo. *TAGA Proceedings,* Sixth Annual Technical Meeting, 1954, pages 156-170 (15 pages). This report covers an unconventional means of engraving. The objective was to eliminate the "powdering" process. "Powdering" accounts for most of the time involved in the etching process. Eliminating the necessity of powdering would greatly shorten the time required to etch a plate. This process will etch a 65-line screen to a depth of 0.005" in less than 10 minutes. The engraving metal used in this process is copper plated zinc. The copper is stripped from the open areas to give a copper relief plate. The exposed zinc is spray etched

with a copper sulphate solution and the sides of the relief are automatically "powdered" by galvanic precipitation from the etchant. This process is still in a laboratory curiosity stage. Refinements are necessary before it can be considered practical. TAGA Proceedings may be purchased for five dollars each from the Secretary, George S. Hammer, Forbes Lithograph Mfg. Co., P.O. Box 513, Boston, Massachusetts.

* ONE-BITE ETCHING PROCESS. *Inland Printer* 134, No. 3, December, 1954, page 64. Zinc-coated magnesium plates, a special etching solution, and a new etching machine form the basis for a new engraving process developed by Acme Telectronix Division of NEA Service, Inc., 1200 West Third Street, Cleveland 13, Ohio, and introduced at the recent convention of the American Photoengravers Association in St. Louis. The plates used in the process have a thin coating of zinc over a magnesium base, and the combination is said to include the advantages of both metals. The plate is exposed in the conventional manner with standard equipment. After exposure, a scumming bath is employed to remove the thin coating of zinc from the unexposed areas, and the plate is then placed in the Acme etching machine where it is sprayed with the special etchant, which builds its own resist on the side walls of lines or dots in the plate. The etching operation takes six to eight minutes for halftones and 15 to 20 minutes for line work or combination plates.

* METHOD FOR DEEP-ETCHING PRINTING PLATES *U.S. Patent 2,692,828*. K. M. Iversen and B. Eugen. *Official Gazette* 687, No. 4, October 26, 1954, page 854. 1. Method of making a printing plate, comprising the steps of forming a first image from a first coating of light-sensitive, etchant-resistant material on the face of a printing plate by placing a negative in contact with said coating, subjecting the plate to the action of light and developing the plate, applying a second light-sensitive, etchant-resistant coating to said plate of a material different than that of said first coating, placing the negative in contact with said second coating and in registry with the first image, imparting a parallel motion between the plate and the negative along a closed curve while subjecting the plate to the action of light, and developing the plate so as to form a second image which overlies said first image and which has its marginal boundaries of all lines, marks and dots enlarged to the same degree throughout its area so that such enlarged boundaries of the second image extend beyond the margins of the first image, etching the plate until the enlarged boundaries of said second image fall off by being undercut up to close proximity with the edges of the first image, removing the second image with a solvent which does not remove the first image, and then effecting a final etch.

A COMPARISON OF A LOW TEMPERATURE (70° F.) DOWANPA HIGH SPEED HALFTONE BATH WITH A NORMAL (90°F.) BATH. Progress Report No. 3. V. L. Young. *American Newspaper Publishers Association Technical Report* No. 19, January 12, 1955, pages 1-2 (2 pages). As an alternate to the present line etching process, Dow Chemical Company has suggested etching with the solution at a low temperature (70° F.) rather than at the normal temperature (90° F.). Many of the installations trying this lower temperature have reported better etching quality and more stability than at the higher temperature. The popularity of the low temperature bath is such that it is felt that it might become the preferred procedure for etching line flats. Should this happen,

the temperature control setting on the line etching machine may have to be changed. Research was conducted to test the compatibility of the halftone process with the lower temperatures. This report covers the investigation of the operation of the halftone etching process at 70° F.

* PHOTOMECHANICAL PRINTING SURFACES. *British Patent 695,197.* Kodak, Ltd. *Abridgement of Specifications* XX, 1955, page 248. Printing plates having a relief image are made by coating a support with a layer of a polymeric soluble cinnamic acid (including a ring substituted derivative thereof) or furylacrylic acid ester of a polyvinyl alcohol or cellulose, exposing to a light image to insolubilize the ester in the exposed areas thereof and washing away the unexposed areas with a solvent for the ester. Polyvinyl cinnamate is the preferred ester and instructions for making this from cinnamoyl chloride and polyvinyl alcohol are provided; similar esters made from o-chloro- or m-nitro-cinnamic acid chlorides or furacrylyl chloride, or the corresponding cellulose esters, may be used. The esters are applied to plates as by whirling or machine coating methods, polyvinyl cinnamate in a mixture of xylene, toluene, n-butyl alcohol and isopropyl alcohol, polyvinyl m-nitrocinnamate in nitrobenzene and cellulose cinnamate in 1:4-dioxane, the coatings being dried at room or elevated temperature in subdued light. The coated plates, which have a speed of the order of bichromated gelatin, are exposed as under a line or halftone image and developed by washing with a hydrocarbon such as benzene or with one of the above-mentioned solvents. Particular types of plates provided with an insolubilized polyvinyl cinnamate relief image in this way are described in seven examples. Patent Specification 695,262 is referred to.

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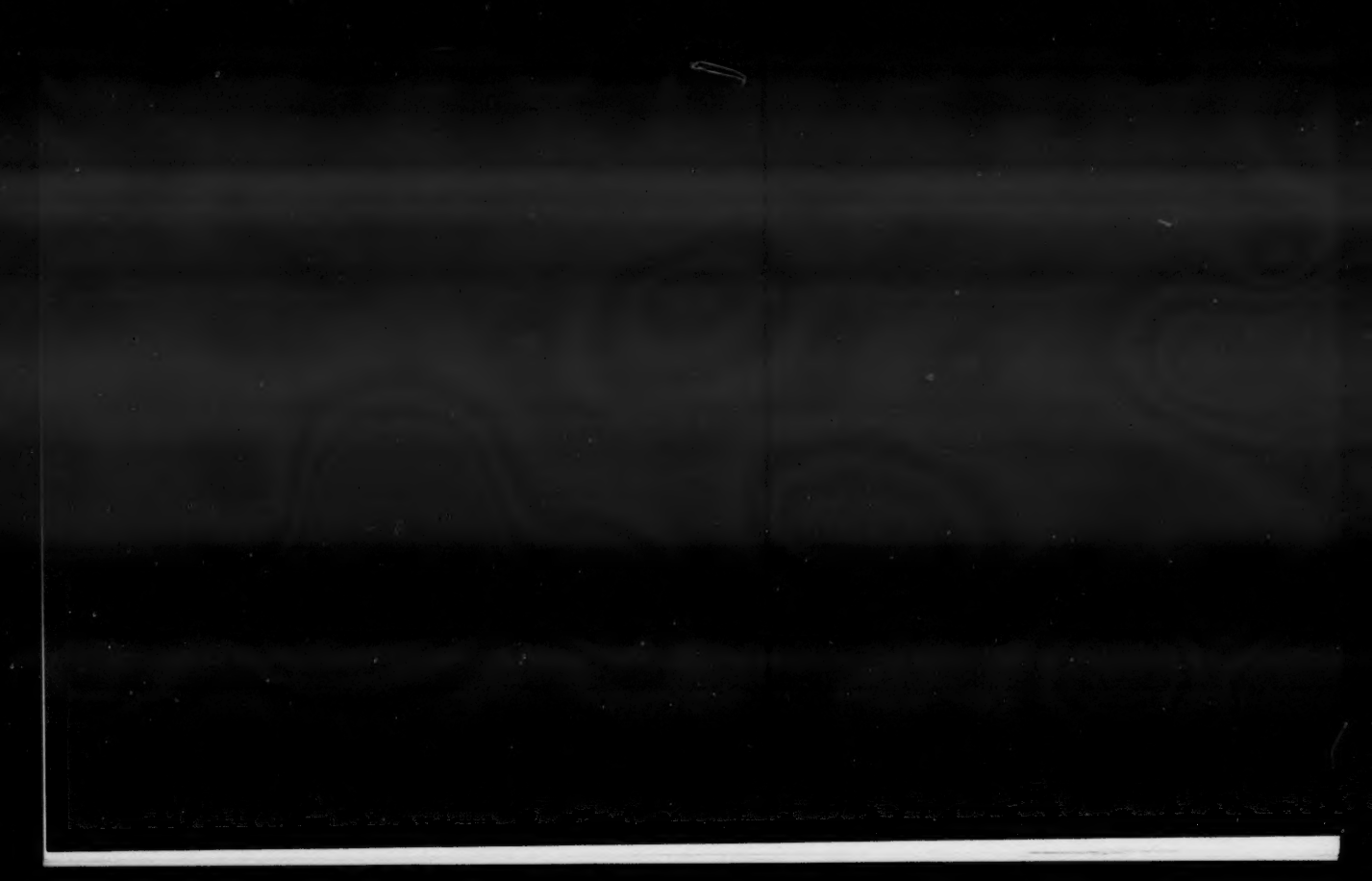
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